(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
13 February 2003 (13.02.2003)

PCT

(10) International Publication Number
WO 2003/011899 A3

(51) International Patent Classification[7]: C07K 7/04, 14/195, 16/12, A61K 39/02, A61P 31/04

(21) International Application Number: PCT/GB2002/003606

(22) International Filing Date: 2 August 2002 (02.08.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

0118825.9	2 August 2001 (02.08.2001)	GB
0200349.9	9 January 2002 (09.01.2002)	GB

(71) Applicants *(for all designated States except US)*: **UNIVERSITY OF SHEFFIELD** [GB/GB]; Western Bank, Sheffield S10 2TN (GB). **BIOSYNEXUS INCORPORATED** [US/US]; 9298 Gaither Road, Gaithersburg, MD 20877 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **FOSTER, Simon** [GB/GB]; Department of Molecular Biology and Biotechnology, University of Sheffield, Western Bank, Sheffield S10 2TN (GB). **MOND, James** [US/US]; 527 Northwest Drive, Silver Spring, MD 20901 (US). **CLARKE, Simon** [GB/GB]; Dept of Molecular Biology and Biotechnology, University of Sheffield, Western Bank, Sheffield S10 2TN (GB). **McDOWELL, Philip** [GB/GB]; Dept of Molecular Biology and Biotechnology, University of Sheffield, Western Bank, Sheffield S10 2TN (GB). **BRUMMEL, Kirsty** [GB/GB]; Dept of Molecular Biology and Biotechnology, University of Sheffield, Western Bank, Sheffield S10 2TN (GB).

(74) Agent: **HARRISON GODDARD FOOTE**; 31 St. Saviourgate, York YO1 8NQ (GB).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

(88) Date of publication of the international search report:
26 February 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 2003/011899 A3

(54) Title: ANTIGENIC POLYPEPTIDES

(57) Abstract: The invention relates to a method for the identification of antigenic polypeptides, typically opsonic antigens, expressed by pathogenic microbes; vaccines comprising said antigens; and therapeutic antibodies directed to said antigenic polypeptides.

INTERNATIONAL SEARCH REPORT

Intern al Application No .
PCT/GB 02/03606

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C07K7/04 C07K14/195 C07K16/12 A61K39/02 A61P31/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C07K A61K A61P

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, BIOSIS, EMBASE, EMBL, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE EMBL [Online] 16 March 1999 (1999-03-16), BARASH ET AL: "Staphylococcus aureus polynucleotides and sequences" XP002250642 retrieved from AAW89789 accession no. EBI Database accession no. AAW89789 * Refers to EP-A-786519, published 30.07.97 (3271 pages); identical with Locus 1, Sequence 3 [4-363 : 2-361]; and SEQ 544 (EP), complete reversed DNA overlap [1400-5088 : 3689-1/Locus 1] * ----- -/--	1-7, 9-16, 18-26

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
8 August 2003	17 11 2003

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Korsner, S-E.

INTERNATIONAL SEARCH REPORT

Inter al Application No
PCT/GB 02/03606

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE EMBL [Online] 1 June 2001 (2001-06-01), KURODA ET AL: "Whole genome sequencing of meticillin-resistant Staphylococcus aureus" XP002250643 retrieved from Q99WI0 accession no. EBI Database accession no. Q99WI0 * 98% overlap in the region 21-251 [Locus 1, Sequence 4] : 1-231; misfits at 49, 83,141,144 and 229 (of Q99WI0) * -----	1
P,X	WO 01 98499 A (UNIVERSITY OF SHEFFIELD / BIOSYNEXUS) 27 December 2001 (2001-12-27)	1-7, 9-16, 18-26
P,Y	* See the whole document - antigenic polypeptides from Staphylococcus aureus; SEQ.ID. 32 = identical with Locus 1, Sequence 1; page 5 -> SEREX * -----	27
Y	SAHIN ET AL: "Serological identification of human tumor antigens" CURRENT OPINION IN IMMUNOLOGY, vol. 9, no. 5, October 1997 (1997-10), pages 709-716, XP004313590 ISSN: 0952-7915 * The original SEREX method / see page 5 of the Application * -----	27
A	US 6 159 469 A (CHOI ET AL) 12 December 2000 (2000-12-12) * See Abstract - antigenic polypeptides from Streptococcus pneumoniae * -----	1-26
A	US 6 086 896 A (SPARLING ET AL) 11 July 2000 (2000-07-11) * See Abstract - antigenic polypeptide from Neisseria meningitidis * -----	1-26
A	US 5 543 323 A (RIDLEY ET AL) 6 August 1996 (1996-08-06) * See Abstract - antigenic polypeptides from Plasmodium * -----	1-26
A	WOOD ET AL: "Identification of antigenic sites on staphylococcal enterotoxin B and toxoid" FEMS IMMUNOLOGY AND MEDICINAL MICROBIOLOGY, vol. 17, 1997, pages 1-10, XP002250576 * See pages 8-9 (3.3 and 4) * -----	1-26

-/--

INTERNATIONAL SEARCH REPORT

Inten al Application No
PCT/GB 02/03606

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
L	DATABASE EMBL [Online] 20 February 2003 (2003-02-20), MASIGNANI ET AL: "Staphylococcus aureus proteins and nucleic acids" XP002250644 retrieved from AX618827 accession no. EBI Database accession no. AX618827 * Refers to WO02094868, published 28.11.02 (international filing date 27.03.02, priority date 27.03.01) without sequences (electronically filed only) - see Locus 1, Sequence 1 = 100% identity * -----	1-26
L	DATABASE EMBL [Online] 20 February 2003 (2003-02-20), MASIGNANI: "Staphylococcus aureus proteins and nucleic acids" XP002250645 retrieved from AX618829 accession no. EBI Database accession no. AX618829 * As above; identical with Locus 1, Sequence 2 (except the first amino acid) * -----	1-26
L	DATABASE EMBL [Online] 20 February 2003 (2003-02-20), MASIGNANI: "Staphylococcus aureus proteins and nucleic acids" XP002250646 retrieved from AX618833 accession no. EBI Database accession no. AX618833 * As above; identical with Locus 1, Sequence 3 (except the first amino acid) * -----	1-26
L	DATABASE EMBL [Online] 20 February 2003 (2003-02-20), MASIGNANI: "Staphylococcus aureus proteins and nucleic acids" XP002250647 retrieved from AX618835 accession no. EBI Database accession no. AX618835 * As above; identical with Locus 1, Sequence 4 (except the first amino acid; erroneous omission of 241-251 ?) * -----	1-26

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB 02/03606

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. [X] Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

see FURTHER INFORMATION sheet PCT/ISA/210

2. [ ] Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. [ ] Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. [ ] As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. [ ] As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. [ ] As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. [X] No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-26 (all partially) and 27 (entirely)

Remark on Protest

[ ] The additional search fees were accompanied by the applicant's protest.

[ ] No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.1

Although Claims 12-17 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the polypeptides/compositions.

Note also that "or part thereof" (Claim 1) has no clear meaning - it would even cover dipeptides in an extreme interpretation.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-26 (all partially) and 27 (entirely)

Invention 1:

Claim 27 (the method used) and a first group of antigenic polypeptides (the 4 peptides of Locus 1, encoded by the first DNA sequence in Table 7), including their uses etc. as of dependent Claims 2-26, as applicable.

Inventions 2-134:

As invention 1 but limited to each subsequent group of peptides as encoded by the 2nd, 3rd,..., 122th DNA sequence

in Table 7, and the 123th,..., 134th DNA sequence in Table 9, as applicable.

Note:

As a consequence of the lack of information in the Description about sequence relations (e.g. common subsequences ?) etc, the actual number of inventions may deviate from the above.
This is, however, not of significance at present.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inte Application No
PCT/GB 02/03606

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 0198499 A	27-12-2001	AU 7424801 A	02-01-2002
		BR 0111823 A	10-06-2003
		CA 2412504 A1	27-12-2001
		CN 1437653 T	20-08-2003
		EP 1292681 A1	19-03-2003
		WO 0198499 A1	27-12-2001
		NO 20025838 A	18-02-2003
		US 2003186275 A1	02-10-2003
US 6159469 A	12-12-2000	US 6573082 B1	03-06-2003
		US 2002061545 A1	23-05-2002
		AU 5194598 A	22-05-1998
		AU 6909098 A	22-05-1998
		EP 0942983 A2	22-09-1999
		EP 0941335 A2	15-09-1999
		JP 2001505415 T	24-04-2001
		JP 2001501833 T	13-02-2001
		WO 9818930 A2	07-05-1998
		WO 9818931 A2	07-05-1998
		US 2002032323 A1	14-03-2002
US 6086896 A	11-07-2000	US 2003104002 A1	05-06-2003
		AT 242784 T	15-06-2003
		AU 8298991 A	18-02-1992
		CA 2087160 A1	17-01-1992
		DE 69133276 D1	17-07-2003
		DK 539492 T3	22-09-2003
		EP 1338607 A2	27-08-2003
		EP 0539492 A1	05-05-1993
		JP 3329452 B2	30-09-2002
		JP 6502394 T	17-03-1994
		JP 2002233390 A	20-08-2002
		WO 9201460 A1	06-02-1992
US 5543323 A	06-08-1996	AT 97693 T	15-12-1993
		AU 633306 B2	28-01-1993
		AU 5121590 A	01-11-1990
		CA 2011031 A1	14-09-1990
		DE 69004721 D1	05-01-1994
		DE 69004721 T2	17-03-1994
		DK 388738 T3	17-01-1994
		EP 0388738 A1	26-09-1990
		ES 2059855 T3	16-11-1994
		GB 2230009 A ,B	10-10-1990
		IE 64212 B1	26-07-1995
		JP 3047088 A	28-02-1991
		PT 93416 A ,B	07-11-1990
		ZA 9001757 A	28-11-1990

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
13 February 2003 (13.02.2003)

PCT

(10) International Publication Number
WO 03/011899 A2

(51) International Patent Classification[7]: C07K 14/195

(21) International Application Number: PCT/GB02/03606

(22) International Filing Date: 2 August 2002 (02.08.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

0118825.9	2 August 2001 (02.08.2001)	GB
0200349.9	9 January 2002 (09.01.2002)	GB

(71) Applicants *(for all designated States except US)*: **UNIVERSITY OF SHEFFIELD** [GB/GB]; Western Bank, Sheffield S10 2TN (GB). **BIOSYNEXUS INCORPORATED** [US/US]; 9298 Gaither Road, Gaithersburg, MD 20877 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **FOSTER, Simon** [GB/GB]; Department of Molecular Biology and Biotechnology, University of Sheffield, Western Bank, Sheffield S10 2TN (GB). **MOND, James** [US/US]; 527 Northwest Drive, Silver Spring, MD 20901 (US). **CLARKE, Simon** [GB/GB]; Dept of Molecular Biology and Biotechnology, University of Sheffield, Western Bank, Sheffield S10 2TN (GB). **McDOWELL, Philip** [GB/GB]; Dept of Molecular Biology and Biotechnology, University of Sheffield, Western Bank, Sheffield S10 2TN (GB). **BRUMMEL, Kirsty** [GB/GB]; Dept of Molecular Biology and Biotechnology, University of Sheffield, Western Bank, Sheffield S10 2TN (GB).

(74) Agent: **HARRISON GODDARD FOOTE**; 31 St. Saviourgate, York YO1 8NQ (GB).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 03/011899 A2

(54) Title: ANTIGENIC POLYPEPTIDES

(57) Abstract: The invention relates to a method for the identification of antigenic polypeptides, typically opsonic antigens, expressed by pathogenic microbes; vaccines comprising said antigens; and therapeutic antibodies directed to said antigenic polypeptides.

Antigenic Polypeptides

The invention relates to a method for the identification of antigenic polypeptides, typically opsonic antigens, expressed by pathogenic microbes; vaccines comprising said antigens; and therapeutic antibodies directed to said antigenic polypeptides.

Microbial organisms cause a number of fatal or debilitating diseases which affect many millions of people around the world. Currently methods to control microbial organisms include the use of antimicrobial agents (antibiotics) and disinfectants. These have proved to be problematic since exposure to these agents places a significant selection pressure resulting in the creation of resistant microbes which can avoid the effects of the antimicrobial agent(s). For example, recently it has been discovered that microbial organisms have become resistant to triclosan, an agent added to many disinfectants used in households and industrial environments.

An arguably greater problem is the evolution of antibiotic resistant strains of a number of significant pathogenic microbes.

For example, and not by way of limitation, it is estimated that there are up to 50 million people world-wide infected with drug resistant tuberculosis (TB) (Figures from the World Health Organisation, 1998). In the past the use of antibiotics to treat TB relied on the administration of single drugs (eg ethionamide) which promoted a relatively high frequency of resistance. For this reason, combinations of drugs are now used to treat tuberculosis. However the fatality rate in cases caused by strains that are resistant to at least one drug used to treat tuberculosis still approaches 50% even when treatment is given. *Mycobacterium tuberculosis*, the causative agent of TB, is a slow growing bacteria and takes a long time to kill. Therefore, for a drug combination to be effective a person with TB must take the drug combination daily for at least six months. Accordingly, patients frequently have to take two or more pills daily and this requires a regimented dosage over a relatively long period of treatment. Many patients take the medications only intermittently and therefore do

not finish the full course of therapy to completely eradicate the *M. tuberculosis* infection. Moreover, TB is strongly associated with HIV infection and therefore the establishment of TB is strongly correlated with immunosuppression.

Vaccination against TB has been available for many years. The bacillus calmette and guerin (BCG) vaccination has been widely used throughout the world for a long time because it is a safe and inexpensive means to vaccinate large numbers of people who potentially could contract TB. BCG is derived from live, attenuated strains of *Mycobacterium bovis*. However the impact of vaccination on the infectious forms of TB is minimal and BCG has therefore contributed little to the overall control of the disease.

A further example of a pathogenic organism which has developed resistance to antibiotics is *Staphylococcus aureus*. *S.aureus* is a bacterium whose normal habitat is the epithelial lining of the nose in about 20-40% of normal healthy people and is also commonly found on people's skin usually without causing harm. However, in certain circumstances, particularly when skin is damaged, this germ can cause infection. This is a particular problem in hospitals where patients may have surgical procedures and/or be taking immunosuppressive drugs. These patients are much more vulnerable to infection with *S.aureus* because of the treatment they have received. Resistant strains of *S.aureus* have arisen in recent years. Methicillin resistant strains are prevalent and many of these resistant strains are also resistant to several other antibiotics. Currently there is no effective vaccination procedure for *S. aureus*. In the US, *S.aureus* infections are the cause of 13% of the two million hospitalised infections each year. This represents 260,000 people with an infection of *S.aureus*, of which 60-80,000 die.

S. aureus is therefore a major human pathogen capable of causing a wide range of life threatening diseases including septicaemia, endocarditis, arthritis and toxic shock. This ability is determined by the versatility of the organism and its arsenal of components involved in virulence. Pathogenicity is multifactorial and no one

component has shown to be responsible for a particular infection, see Projan, S.J. & Novick, R.P. (1997) in The Staphylococci in Human Disease (Crossley, K.B. & Archer, G.L., eds.) pp.55-81.

At the onset of infection, and as it progresses, the needs and environment of the organism changes and this is mirrored by a corresponding alteration in the virulence determinants which *S. aureus* produces. At the beginning of infection it is important for the pathogen to adhere to host tissues and so a large repertoire of cell surface associated attachment proteins are made. These include collagen-, fibrinogen- and fibronectin-binding proteins. The pathogen also has the ability to evade host defences by the production of factors that reduce phagocytosis or interfere with the ability of the cells to be recognised by circulating antibodies.

Often a focus of infection develops as an abscess and the number of organisms increases. *S. aureus* has the ability to monitor its own cell density by the production of a quorum sensing peptide. Accumulation of the peptide, associated with physiological changes brought about by the beginning of starvation of the cells, elicits a switch in virulence determinant production from adhesins to components involved in invasion and tissue penetration. These include a wide range of hemolysins, proteases and other degradative enzymes.

During the process of any infection the virulence determinants made by *S. aureus* are produced in response to environmental and physiological stimuli. These stimuli will be dependent on the niche within the body and will change as the infection progresses. Little is known of the conditions *in vivo* and it is likely that some components are produced solely in this environment. These are therefore potential vaccine components, which could not be discovered by previous techniques.

One of the most important developments in recent medical history is the development of vaccines which provide prophylactic protection from a wide variety of pathogenic organisms. Many vaccines are produced by inactivated or attenuated pathogens which are injected into an individual. The immunised individual responds by producing both a humoral (antibody) and cellular (cytolytic T cells, CTL's) response. For example, hepatitis vaccines are made by heat inactivating the virus and treating it with a cross linking agent such as formaldehyde. An example of an attenuated pathogen useful as a vaccine is represented by polio vaccines which are produced by attenuating a live pathogen.

However the use of attenuated organisms in vaccines for certain diseases is problematic due to the lack of knowledge regarding the pathology of the condition and the nature of the attenuation. For certain viral agents this is a particular problem since viruses, in particular retroviruses, have an error prone replication cycle which results viable mutations in the genes which comprise the virus. This can result in alterations to antigenic determinants which have previously been used as vaccines. An alternative to the use of inactivated or attenuated pathogens is the identification of pathogen epitopes to which the immune system is particularly sensitive. In this regard many pathogenic toxins produced by pathogenic organisms during an infection are particularly useful in the development of vaccines which protect the individual from a particular pathogenic organism.

The development of so-called subunit vaccines (vaccines in which the immunogen is a fragment or subunit of a protein or complex expressed by a particular pathogenic organism) has been the focus of considerable medical research. The need to identify candidate molecules useful in the development of subunit vaccines is apparent not least because conventional chemotherapeutic approaches to the control of pathogenic organisms has more recently been stymied by the development of antibiotic resistance. A number of methods have been developed to identify potential antigenic polypeptides which can be used as a vaccine. One such method is disclosed herein.

It has been known for many years that tumour cells produce a number of tumour cell specific antigens, some of which are presented at the tumour cell surface. The immune system recognises these antigens as foreign thereby resulting in the production of antibodies to self antigens, so called autoantibodies or autologous antisera.

One such technique is Serological identification of antigens by recombinant Expression Cloning, abbreviated to SEREX.

Typically, the technique involves the extraction of RNA from tumour tissue followed by the selective enrichment of mRNA from the isolated total RNA. The mRNA is reverse transcribed into cDNA using viral reverse transcriptase. The cDNA thus synthesised is subcloned into an expression vector and transformed into an appropriate bacterial strain. The transformed bacteria are plated onto a suitable nutrient agar and under appropriate growth conditions the subcloned cDNA is expressed from the expression vector in the bacterial cell. The cells are lysed naturally by the use of phage based expression vectors, for example λ phage or phagemid based vectors, which through their lytic cycle cause cell lysis. The released polypeptides are transferred to a suitable membrane support (i.e. nitrocellulose, nylon) and exposed to autologous antisera from the patient from which the tumour tissue was originally isolated. The immunoscreening methodology allows the identification of genes that are over expressed or inappropriately expressed in a selected tumour tissue from a patient.

We have exploited this techinque to identify antigenic polypeptides expressed by pathogenic organisms during an infection. Autologous antisera produced during the infection is used to screen an expression library created from genomic DNA to identify and clone antigens.

In its broadest aspect the invention relates to the identification of antigenic polypeptides expressed during an infection by a pathogenic microbe and their use in vaccination.

According to a first aspect of the invention there is provided a method to identify opsonic antigens expressed by pathogenic organisms comprising:

(i) providing a nucleic acid library encoding genes or partial gene sequences of a pathogenic organism;

(ii) transforming/transfecting said library into a host cell;

(iii) providing conditions conducive to the expression of said transformed/transfected genes or partial gene sequences;

(iv) contacting the antigens expressed by the genes/partial gene sequences with autologous antisera derived from an animal infected with, or has been infected with, said pathogenic organism;

(v) purifying the nucleic acid encoding the antigens or partial antigenic polypeptides binding to said autologous antisera; and

(vi) testing the opsonic activity of a polypeptide encoded by said DNA molecule.

In a preferred method of the invention said library comprises genomic DNA of a pathogenic organism.

Ideally said pathogenic organism is bacterial.

More preferably still said bacterial organism is selected from the following: *Staphylococcus aureus; Staphylococcus epidermidis; Enterococcus faecalis; Mycobacterium tuberculsis; Streptococcus group B; Streptoccocus pneumoniae; Helicobacter pylori; Neisseria gonorrhea; Streptococcus group A; Borrelia*

burgdorferi; Coccidiodes immitis; Histoplasma sapsulatum; Neisseria meningitidis type B; Shigella flexneri; Escherichia coli; Haemophilus influenzae.

Preferably still said pathogenic organism is of the genus *Staphylococcus spp.* Ideally organism is *Staphylococcus aureus* or *Staphylococcus epidermidis.*

In a further preferred embodiment of the invention said nucleic acid library is a lambda library, ideally a lambda expression library.

According to a second aspect of the invention there is provided a nucleic acid molecule comprising a DNA sequence selected from:

(i) the DNA sequence as represented by the DNA sequences herein disclosed in Table 7 or Table 9;

(ii) DNA sequences which hybridise to the sequences identified in (i) above which encode a polypeptide expressed by a pathogenic organism and

(iii) DNA sequences which are degenerate as a result of the genetic code to the DNA sequences defined in (i) and (ii).

In a yet still further preferred embodiment of the invention said nucleic acid molecule is genomic DNA.

In a preferred embodiment of the invention there is provided an isolated nucleic acid molecule which anneals under stringent hybridisation conditions to the sequences herein disclosed.

Stringent hybridisation/washing conditions are well known in the art. For example, nucleic acid hybrids that are stable after washing in 0.1xSSC, 0.1% SDS at 60°C. It

is well known in the art that optimal hybridisation conditions can be calculated if the sequences of the nucleic acid is known. For example, hybridisation conditions can be determined by the GC content of the nucleic acid subject to hybridisation. Please see Sambrook *et al* (1989) Molecular Cloning; A Laboratory Approach. A common formula for calculating the stringency conditions required to achieve hybridisation between nucleic acid molecules of a specified homology is:

$$T_m = 81.5^0\,C + 16.6\,\mathrm{Log}\,[Na^+] + 0.41[\,\%\,G+C] - 0.63\,(\%\mathrm{formamide}).$$

According to a third aspect of the invention there is provided at least one polypeptide identified by the method according to the invention.

In a preferred embodiment of the invention, said polypeptide is associated with infective pathogenicity of an organism according to any previous aspect or embodiment of the invention.

More preferably still said polypeptide is at least one, or part part thereof, of the amino acid sequences represented in Tables 8 or Table 10.

In an alternative preferred embodiment of the invention said polypeptide carries a non-protein antigen, for example a polysaccharide antigen.

According to a fourth aspect of the invention there is provided a nucleic acid molecule characterised in that said nucleic acid molecule is part of a vector adapted to facilitate recombinant expression of the polypeptide encoded by said nucleic acid molecule.

In a preferred embodiment of the invention said vector is an expression vector adapted for prokaryotic gene expression. Alternatively said expression vector is adapted for eukaryotic gene expression.

Typically said adaptation includes, by example and not by way of limitation, the provision of transcription control sequences (promoter sequences) which mediate cell specific expression. These promoter sequences may be cell specific, inducible or constitutive.

Promoter is an art recognised term and, for the sake of clarity, includes the following features which are provided by example only, and not by way of limitation. Enhancer elements are *cis* acting nucleic acid sequences often found 5' to the transcription initiation site of a gene (enhancers can also be found 3' to a gene sequence or even located in intronic sequences and is therefore position independent). Enhancers function to increase the rate of transcription of the gene to which the enhancer is linked. Enhancer activity is responsive to *trans* acting transcription factors (polypeptides) which have been shown to bind specifically to enhancer elements. The binding/activity of transcription factors (please see Eukaryotic Transcription Factors, by David S Latchman, Academic Press Ltd, San Diego) is responsive to a number of environmental cues which include, by example and not by way of limitation, intermediary metabolites (eg glucose, lipids), environmental effectors (eg light, heat,).

Promoter elements also include so called TATA box and RNA polymerase initiation selection (RIS) sequences which function to select a site of transcription initiation. These sequences also bind polypeptides which function, *inter alia*, to facilitate transcription initiation selection by RNA polymerase.

Adaptations also include the provision of selectable markers and autonomous replication sequences which both facilitate the maintenance of said vector in either the eukaryotic cell or prokaryotic host. Vectors which are maintained autonomously are referred to as episomal vectors.

Adaptations which facilitate the expression of vector encoded genes include the provision of transcription termination/polyadenylation sequences. This also includes

the provision of internal ribosome entry sites (IRES) which function to maximise expression of vector encoded genes arranged in bicistronic or multi-cistronic expression cassettes.

These adaptations are well known in the art. There is a significant amount of published literature with respect to expression vector construction and recombinant DNA techniques in general. Please see, Sambrook et al (1989) Molecular Cloning: A Laboratory Manual, Cold Spring Harbour Laboratory, Cold Spring Harbour, NY and references therein; Marston, F (1987) DNA Cloning Techniques: A Practical Approach Vol III IRL Press, Oxford UK; DNA Cloning: F M Ausubel et al, Current Protocols in Molecular Biology, John Wiley & Sons, Inc.(1994).

According to yet a further aspect of the invention there is provided a method for the production of the polypeptides according to any previous aspect or embodiment of the invention comprising:

(i) providing a cell transformed/transfected with a vector according to the invention;

(ii) growing said cell in conditions conducive to the manufacture of said polypeptides; and

(iii) purifying said polypeptide from said cell, or its growth environment.

In a preferred method of the invention said vector encodes, and thus said recombinant polypeptide is provided with, a secretion signal to facilitate purification of said polypeptide.

According to a fifth aspect of the invention there is provided a cell or cell-line transformed or transfected with the vector according to the invention.

In a preferred embodiment of the invention said cell is a prokaryotic cell. Alternatively said cell is a eukaryotic cell selected from: fungal, insect, amphibian; mammalian; plant.

According to a yet further aspect of the invention there is provided a vaccine comprising at least one antigen or antigenic polypeptide according to the invention.

Ideally said vaccine further comprises a carrier and/or adjuvant.

The terms adjuvant and carrier are construed in the following manner. Some polypeptide or peptide antigens contain B-cell epitopes but no T cell epitopes. Immune responses can be greatly enhanced by the inclusion of a T cell epitope in the polypeptide/peptide or by the conjugation of the polypeptide/peptide to an immunogenic carrier protein such as key hole limpet haemocyanin or tetanus toxoid which contain multiple T cell epitopes. The conjugate is taken up by antigen presenting cells, processed and presented by human leukocyte antigens (HLA's) class II molecules. This allows T cell help to be given by T cell's specific for carrier derived epitopes to the B cell which is specific for the original antigenic polypeptide/peptide. This can lead to increase in antibody production, secretion and isotype switching.

An adjuvant is a substance or procedure which augments specific immune responses to antigens by modulating the activity of immune cells. Examples of adjuvants include, by example only, agonsitic antibodies to co-stimulatory molecules, Freunds adjuvant, muramyl dipeptides, liposomes. An adjuvant is therefore an immunomodulator. A carrier is an immunogenic molecule which, when bound to a second molecule augments immune responses to the latter.

In yet a further aspect of the invention there is provided a method to immunise an animal against a pathogenic microbe comprising administering to said animal at least one polypeptide, or part thereof, according to the invention or the vaccine according to the invention.

In a preferred method of the invention said animal is human.

Preferably the vaccine, or antigenic polypeptide, can be delivered by direct injection either intravenously, intramuscularly, subcutaneously. Further still, the vaccine or antigenic polypeptide, may be taken orally.

Preferably the vaccine is against the bacterial species *Staphylococcus aureus.*

The vaccine may also be against the bacterial species *Staphylococcus epidermidis.*

It will also be apparent that vaccines or antigenic polypeptides are effective at preventing or alleviating conditions in animals other than humans, for example and not by way of limitation, family pets, livestock, horses.

According to a further aspect of the invention there is provided an antibody, or at least an effective binding part thereof, which binds at least one antigen or antigenic polypeptide according to the invention.

In a preferred embodiment of the invention said antibody is a polyclonal or monoclonal antibody wherein said antibody is specific to said polypeptide.

Alternatively, said antibody is a chimeric antibody produced by recombinant methods to contain the variable region of said antibody with an invariant or constant region of a human antibody.

In a further alternative embodiment of the invention, said antibody is humanised by recombinant methods to combine the complimentarity determining regions of said antibody with both the constant (C) regions and the framework regions from the variable (V) regions of a human antibody.

Preferably said antibody is provided with a marker including a conventional label or tag, for example a radioactive and/or fluorescent and/or epitope label or tag.

Preferably said humanised monoclonal antibody to said polypeptide is produced as a fusion polypeptide in an expression vector suitably adapted for transfection or transformation of prokaryotic or eukaryotic cells.

Antibodies, also known as immunoglobulins, are protein molecules which have specificity for foreign molecules (antigens). Immunoglobulins (Ig) are a class of structurally related proteins consisting of two pairs of polypeptide chains, one pair of light (L) (low molecular weight) chain (κ or λ), and one pair of heavy (H) chains (γ, α, μ, δ and ε), all four linked together by disulphide bonds. Both H and L chains have regions that contribute to the binding of antigen and that are highly variable from one Ig molecule to another. In addition, H and L chains contain regions that are non-variable or constant.

The L chains consist of two domains. The carboxy-terminal domain is essentially identical among L chains of a given type and is referred to as the "constant" (C) region. The amino terminal domain varies from L chain to L chain and contributes to the binding site of the antibody. Because of its variability, it is referred to as the "variable" (V) region.

The H chains of Ig molecules are of several classes, α, μ, σ, α, and γ (of which there are several sub-classes). An assembled Ig molecule consisting of one or more units of two identical H and L chains, derives its name from the H chain that it possesses. Thus, there are five Ig isotypes: IgA, IgM, IgD, IgE and IgG (with four sub-classes based on the differences in the H chains, i.e., IgG1, IgG2, IgG3 and IgG4). Further detail regarding antibody structure and their various functions can be found in, Using Antibodies: A laboratory manual, Cold Spring Harbour Laboratory Press.

Chimeric antibodies are recombinant antibodies in which all of the V-regions of a mouse or rat antibody are combined with human antibody C-regions. Humanised antibodies are recombinant hybrid antibodies which fuse the complimentarity determining regions from a rodent antibody V-region with the framework regions from the human antibody V-regions. The C-regions from the human antibody are also used. The complimentarity determining regions (CDRs) are the regions within the N-terminal domain of both the heavy and light chain of the antibody to where the

majority of the variation of the V-region is restricted. These regions form loops at the surface of the antibody molecule. These loops provide the binding surface between the antibody and antigen.

Antibodies from non-human animals provoke an immune response to the foreign antibody and its removal from the circulation. Both chimeric and humanised antibodies have reduced antigenicity when injected to a human subject because there is a reduced amount of rodent (i.e. foreign) antibody within the recombinant hybrid antibody, while the human antibody regions do not illicit an immune response. This results in a weaker immune response and a decrease in the clearance of the antibody. This is clearly desirable when using therapeutic antibodies in the treatment of human diseases. Humanised antibodies are designed to have less "foreign" antibody regions and are therefore thought to be less immunogenic than chimeric antibodies.

In a further preferred embodiment of the invention said antibodies are opsonic antibodies.

Phagocytosis is mediated by macrophages and polymorphic leukocytes and involves the ingestion and digestion of micro-organisms, damaged or dead cells, cell debris, insoluble particles and activated clotting factors. Opsonins are agents which facilitate the phagocytosis of the above foreign bodies. Opsonic antibodies are therefore antibodies which provide the same function. Examples of opsonins are the Fc portion of an antibody or compliment C3.

In another aspect of the invention there is provided a vector which is adapted for the expression of the humanised or chimeric antibodies according to the invention.

In a yet further aspect of the invention, there is provided a cell or cell line which has been transformed or transfected with the vector encoding the humanised or chimeric antibody according to the invention.

In a yet further aspect of the invention there is provided a method for the production of the humanised or chimeric antibody according to the invention comprising :

(i) providing a cell transformed or transfected with a vector which comprises a nucleic acid molecule encoding the humanised or chimeric antibody according to the invention;

(ii) growing said cell in conditions conducive to the manufacture of said antibody; and

(iii) purifying said antibody from said cell, or its growth environment.

In a yet further aspect of the invention there is provided a hybridoma cell line which produces a monoclonal antibody as hereinbefore described.

In a further aspect of the invention there is provided a method of producing monoclonal antibodies according to the invention using hybridoma cell lines according to the invention.

In a further aspect of the invention there is provided a method for preparing a hybridoma cell-line producing monoclonal antibodies according to the invention comprising the steps of:

i) immunising an immunocompetent mammal with an immunogen comprising at least one polypeptide having the amino acid sequence as represented in Table 8 or 10, or fragments thereof;

ii) fusing lymphocytes of the immunised immunocompetent mammal with myeloma cells to form hybridoma cells;

iii) screening monoclonal antibodies produced by the hybridoma cells of step (ii) for binding activity to the amino acid sequences of (i);

iv) culturing the hybridoma cells to proliferate and/or to secrete said monoclonal antibody; and

v) recovering the monoclonal antibody from the culture supernatant.

Preferably, the said immunocompetent mammal is a mouse. Alternatively, said immunocompetent mammal is a rat.

The production of monoclonal antibodies using hybridoma cells is well-known in the art. The methods used to produce monoclonal antibodies are disclosed by Kohler and Milstein in Nature 256, 495-497 (1975) and also by Donillard and Hoffman, "Basic Facts about Hybridomas" in Compendium of Immunology V.II ed. by Schwartz, 1981, which are incorporated by reference.

In a further aspect of the invention there is provided the use of the antibodies for manufacture of a medicament for the treatment of *Staphylococcus aureus*-associated septicaemia, food-poisoning or skin disorders.

In another aspect of the invention there is provided the use of the antibodies according to the invention for the manufacture of a medicament for the treatment of *Staphylococcus epidermidis*-associated septicaemia, peritonitis or endocarditis.

It will be apparent that the polypeptides identified by the method according to the invention will facilitate the production of therapeutic antibodies to a range of diseases resulting from pathogenic infection, for example, septicaemia; tuberculosis; bacteria-associated food poisoning; blood infections; peritonitis; endocarditis; sepsis; meningitis; pneumonia; stomach ulcers; gonorrhoea; strep throat; streptococcal-associated toxic shock; necrotizing fasciitis; impetigo; histoplasmosis; Lyme disease; gastro-enteritis; dysentery; shigellosis.

As has already been stated earlier, microbial organisms cause a wide variety of diseases. Listed below, and not by way of limitation, are a number of micro-organisms and some of the diseases they cause.

Micro-organism	**Disease(s) caused**
Staphylococcus aureus	Sepsis, food poisoning, septicaemia,
Staphylococcus epidermidis	Peritonitis, septicaemia, endocarditis,

	other hospital-associated diseases
Enterococcus faecalis	Endocarditis, cystitis, wound infections
Mycobacterium tuberculosis	Tuberculosis
Streptococcus group B	Sepsis, meningitis, pneumonia, bladder infections
Streptococcus pneumoniae	Pneumonia, meningitis
Helicobacter pylori	Stomach ulcers
Neisseria gonorrhoea	Gonorrhoea
Streptococcus group A	Strep throat, necrotizing fasciitis, impetigo, Strep. Toxic shock syndrome
Borrelia burgdoferi	Lyme disease
Coccidiodes immitis	Pneumonia
Histoplasma sapsulatum	Histoplasmosis, pneumonia
Neisseria meningitidis type B	Meningitis
Shigella flexneri	Gastro-enteritis, shigellosis, dysentry
Escherichia coli	Food-poisoning, gastro-enteritis
Haemophilus influenzae	Meningitis, pneumonia, arthritis, cellulitis

An embodiment of the invention will now be described by example only and with reference to the following materials, methods and tables:

Table 1 illustrates the immunization and bleed schedule for production of monoclonal antibodies reactive with peptide Hex A;

Table 2 illustrates an immunoassay of sera from mice immunized with peptide Hex A;

Table 3 illustrates an immunoassay of supernatants from anti-Hex A hybridoma supernatants;

Table 4 illustrates the immunization and bleed schedule for production of monoclonal antibodies reactive with peptide 29kDa peptide;

Table 5 illustrates an immunoassay of day 98 sera from mice immunized with peptide 29kDa;

Table 6 illustrates an immunoassay of supernatants from anti-29kDa hybridomas supernatants from T75 Culture Flasks;

Table 7 represents the DNA sequences of *S.aureaus* partial gene sequences identified by the screening method;

Table 8 represents the protein sequences encoded by the DNA sequences illustrated in Table 7;

Table 9 represents the DNA sequences of *S.epidermidis* partial gene sequences identified by the screening method; and

Table 10 represents the protein sequences of the DNA sequences illustrated in Table 9.

Materials and Methods

Screening Genomic Libraries of *S. aureus* and *S.epidermidis*

A λZAP Express library of genomic DNA of *S. aureus* 8325/4 and *S.epidermidis* was used. It contains fragments of 2-10kb from a partial *Sau*3A digest of total genomic DNA. This was cloned into the *Bam*H1 site of the vector. The library contains >10x coverage of the genome. The library was probed by plaque lift using an initial screen of approximately 20,000 plaque forming units on a 9cm diameter Petri dish. The plating cells used, their treatment, the plating procedure and buffers were exactly as described in the manufacturers handbook (Stratagene). Plating cells, *Escherichia coli* XL1-Blue MRF', were infected with phage and plated in 3 ml top LB agar containing 10 mM $MgSO_4$ onto LB plates containing 10 mM $MgSO_4$. The plates were then incubated at 42°C for 4 hr. An 8.5cm diameter nitrocellulose filter disc (previously soaked in 10 mM IPTG and air-dried) was placed on each plate and its location marked. The plates were then incubated for a further 3.5 hr at 37^0C. The

filters were removed and washed in TBST buffer before blocking overnight at 4°C in TBST containing 6% w/v dried skimmed milk and 3% v/v pig serum (Sigma). The serum was used to block any Protein A clones on the filter. The filters are then treated with patient serum (1/5000 dilution) in blocking solution for 90 min at room temperature. Antisera have been obtained from patients convalescing from major *S. aureus* infections. The filters are then washed for 3x10 min in TBST. Secondary antibody used was goat anti-human whole IgG alkaline phosphatase linked (Sigma) at 1/30,000 dilution in blocking solution at room temperature for 30 min. The filters were then washed as above and developed using a standard colorimetric procedure.

Cross-reactive plaques were located on the agar plates and cored into 0.2ml phage buffer with 0.02 ml chloroform. The titre of each core stock was determined and the phage plated at approximately 200 plaques per plate. A plaque lift and screen was performed as above to give single, pure cross-reactive clones.

The pure clones were then spotted (1µl) onto plates to give a confluent plaque of 0.5cm diameter. 30 individual clones can be spotted on each plate. A plaque lift is performed and the filter probed with an appropriate sera. In this way clones can be tested for their cross-reactivity with other patient sera, non-infected donor sera and anti-Protein A sera.

Individual clones were then excised to give a phagemid in *E. coli* XLOLR using the manufacturers protocol (Stratagene). A plasmid miniprep of each was carried out and the size of the genomic insert determined by restriction mapping. The identity of the cloned insert was determined by DNA sequencing using primers against vector sequence, which allows sequencing across the insert. By comparison of the derived sequence against the public domain databases the nature of the cloned gene(s) can be determined.

Hybridisation Solutions/Conditions

Typically, hybridisation conditions uses 4 – 6 x SSPE (20x SSPE contains 175.3g NaCl, 88.2g NaH_2PO_4 H_2O and 7.4g EDTA dissolved to 1 litre and the pH adjusted to 7.4); 5-10x Denhardts solution (50x Denhardts solution contains 5g Ficoll (type 400, Pharmacia), 5g polyvinylpyrrolidone abd 5g bovine serum albumen; 100μg-1.0mg/ml sonicated salmon/herring DNA; 0.1-1.0% sodium dodecyl sulphate; optionally 40-60% deionised formamide. Hybridisation temperature will vary depending on the GC content of the nucleic acid target sequence but will typically be between 42^0- 65^0 .

Mouse Model for Testing Candidate Vaccine Polypeptides

Mice are injected intravenously with 5 x 10^7 S. aureus and mortality, bacteremia and abscess formation is monitored over the ensuing 7 days. At this dose 100% of the mice are bacteremic for greater than 4 days , 100% have detectable abscess formation in liver and kidney and greater than 80% of mice die within four days. At lower doses of injected organisms, bacteremia is detectable in the absence of death.

Immunization Program

Single proteins are injected at a dose of 10-100ug per mouse in RIBI adjuvant, boosted 14 and 28 days later and bled 14 and 28 days thereafter for evaluation of antibodies in their sera using ELISA. When groups of proteins are injected the final amount of each protein will be 10ug per mouse and the above immunization scheme will be followed.

Evaluation of Protective Efficacy of Single or Groups of Proteins

We will employ the mouse infection model described above to evaluate the protective efficacy of the proteins that are being tested. To this end groups of 5 mice will be immunized with single proteins or pools of 5 proteins as described above. We will monitor antibody titers to the injected proteins and when high titers are reached we will inoculate mice with *S aureus* at high and low dose. Control mice that have

not been immunized or that were immunized with adjuvant only will also be inoculated with *S aureus*. We will measure levels of bacteremia,abscess formation and survival in all groups. All parameters of infection will be suppressed in mice that have high circulating levels of protective antibodies. If we find a pool of proteins that induces protection we will compare the protection induced by the individual components to that induced by the pool of proteins to see if protection was induced by a single protein or by the combined action of antibodies to multiple proteins. Using this approach we will identify protein epitopes that are protective.

In addition to using the *in vivo* model of mouse infection we will also obtain the sera from mice that are injected as above and monitor their sera for opsonophagocytic activity using a complement dependent system in the presence of human polymorphonuclear lymphocytes. This assay is well known in the art. This assay has been used an *in vitro* surrogate for measuring protective efficacy of antibody. Spleens from mice that have opsonophagocytic antibodies will then be used as fusion partners in an attempt to make monoclonal antibodies that are reactive with *S. aureus* .

Using this multipronged approaches we will have a high level of confidence that we can identify protective epitopes that can be used either in a vaccine construct or that can be used to generate monoclonal antibodies.

EXAMPLE 1

Immunoassay for detection of antibodies reactive with peptide Hex A

The binding of mouse sera or MAbs to Hex A was measured by immunoassay on wells coated with Hex A. One hundred microliters of a 250 – 500 ng/ml solution of Hex A in PBS was distributed into replicate Nunc Maxisorp Stripwells and incubated overnight at room temperature. The unbound material was removed from the wells by washing four times with PBS-T. Unbound antigen was removed from the plate by washing four times with PBS-T. Antibody, diluted in PBS-T, was then added to the wells and incubated at room temperature for 30-60 minutes. After addition of the antibody, the wells were incubated at room temperature for 30-60 minutes in a draft-

free environment. The wells were again washed four times with PBS-T and ninety-five microliters of detection antibody was then added to each well. The detection antibody was either peroxidase-labeled goat anti-mouse IgG (gamma-specific), diluted 1:10000 in PBS-T, or peroxidase-labeled rabbit anti-mouse IgG_1, diluted 1:6000 in PBS-T.

Following another 30-60 minute incubation at room temperature, the wells were washed four times with PBS-T and each well received 100 µl of TMB substrate solution (BioFx #TMBW-0100-01). Plates were incubated in the dark at room temperature for 15 minutes and the binding reactions were stopped by the addition of 100 µl of TMB stop solution (BioFx #STPR-0100-01). The absorbance of each well was measured at 450 nm using a Molecular Devices Vmax plate reader.

Isotype was determined using a mouse immunoglobulin isotype kit obtained from Zymed Laboratories (Cat. No. 90-6550).

Immunization of Mice for Production of Monoclonal Antibodies Reactive with Peptide Hex A.

Five female BALB/c mice, approximately 8 weeks of age, were immunized with Hex A according to the schedule described in Table 1. All immunizations were administered subcutaneously in 50% RIBI adjuvant. Sera from the mice were tested by immunoassay, and based on the results of the assay described in Table 2, mouse 2021 was selected for hybridoma production. Mouse 2021 received a booster immunization of 32.5 ug of Hex A in PBS, administered intraperitoneally, three days prior to the production of hybridomas.

TABLE 1

Immunization and Bleed Schedule for Production of Monoclonal Antibodies Reactive with Peptide Hex A

Experimental Day		Boost (ug/mouse)	Adjuvant		Bleed
0		10 ug	RIBI		Yes
34		8.3	RIBI		Yes
48		None			Yes
60		25 ug	RIBI		Yes
74		None			Yes
98		25 ug	RIBI		Yes
124		None			Yes

TABLE 2

Immunoassay of Sera from Mice Immunized with Peptide Hex A

Serum Dilution	2021	2022	2023	2024	2025
1000	3.553	3.569	3.226	3.336	3.439
3000	2.803	2.538	2.357	2.575	2.403
9000	1.663	1.336	1.314	1.522	1.357
27000	0.793	0.618	0.622	0.716	0.598
Buffer	0.095	0.078	0.145	0.066	0.089

Preparation of Hybridomas Reactive with Hex A Peptide

Hybridomas were prepared by the general methods of Shulman, Wilde and Kohler and Bartal and Hirshaut (34, 48). Mouse 2021 was selected for hybridoma production based on the results of an immunoassay and received a booster immunization of 32.5 ug of antigen three days prior to sacrifice. Spleenocytes from

mouse 2028 were isolated and mixed with mouse myeloma cells SP2/0 (ATCC Catalog number CRL 1581) at a ratio of 10 spleenocytes:1 myeloma. The cells were pelleted by centrifugation (400 X g, 10 minutes at room temperature) and washed in serum free medium. The supernatant was removed to near-dryness and fusion of the cell mixture was accomplished in a sterile 50 ml centrifuge conical by the addition of 1 ml of warm (37°C) polyethylene glycol (PEG; mw 1400; Boehringer Mannheim) over a period of 60-90 seconds. The PEG was diluted by slow addition of serum-free medium in successive volumes of 1, 2, 4, 8, 16 and 19 mls. The hybridoma cell suspension was gently resuspended into the medium and the cells pelleted by centrifugation (500 X g, 10 minutes at room temperature). The supernatant was removed and the cells resuspended in medium RPMI 1640, supplemented with 15% heat-inactivated fetal bovine serum, 0.05 mM hypoxanthine and 16 μM thymidine (HT medium). One hundred μl of the hybridoma cells were planted into 952 wells of 96-well tissue culture plates. Eight wells (column 1 of plate A) received approximately 2.5 X 10^4 SP/20 cells in 100 μl. The SP/20 cells served as a control for killing by the selection medium added 24 hours later:

Twenty four hours after preparation of the hybridomas, 100 μl of RPMI 1640, supplemented with 15% heat-inactivated fetal bovine serums, 0.1 mM hypoxanthine, 0.8 μM aminopterin and 32 μM thymidine (HAT medium) was added to each well. Ninety-six hours after the preparation of the hybridomas, the SP/20 cells in plate A, column 1 appeared to be dead, indicating that the HAT selection medium had successfully killed the unfused SP/20 cells.

Ten days after the preparation of the hybridomas, supernatants from all wells were tested by ELISA for the presence of antibodies reactive with peptide Hex A. Based on the results of this preliminary assay, cells from three wells were transferred to a 24-well culture dish and expanded. Supernatants from these cultures were retested by ELISA for the presence of antibodies that bind to peptide Hex A.

Using IgG-1-specific detection, the absorbance values obtained with the supernatants from hybridoma culture 02-101FE1, 02-101ED8 and 02-100JC10 were 2.150, 2.230 and 2.574, respectively, compared to an absorbance of 0.044 with buffer alone (Table 3). Absorbances were lower, but still positive, with gamma-specific detection (Table 3). Each of the cultures was expanded, cryopreserved and cloned by limiting dilution. Two-three clones of each culture were expanded and cryopreserved for future evaluation.

TABLE 3

Immunoassay of Supernatants from Anti-Hex A Hybridoma Supernatants

Culture ID	Dilution	Detection With Anti-Mouse IgG-1	Detection With Anti-Mouse Gamma
02-101FE1	2	2.150	0.941
02-101JC10	2	2.574	1.403
02-101ED8	2	2.238	1.174
Buffer		0.044	0.073

EXAMPLE 2

Immunoassay for detection of antibodies reactive with peptide 29kDa

The binding of mouse sera or MAbs to 29kDa was measured by immunoassay on wells coated with 29kDa. One hundred microliters of a 500 - 1000 ng/ml solution of 29kDa in PBS was distributed into replicate Nunc Maxisorp Stripwells and incubated overnight at room temperature. The unbound material was removed from the wells by washing four times with PBS-T. Unbound antigen was removed from the plate by washing four times with PBS-T. Antibody, diluted in PBS-T, was then added to the wells and incubated at room temperature for 30-60 minutes. After addition of the antibody, the wells were incubated at room temperature for 30-60 minutes in a draft-

free environment. The wells were again washed four times with PBS-T and ninety-five microliters of detection antibody was then added to each well. The detection antibody was either peroxidase-labeled goat anti-mouse IgG (gamma-specific), diluted 1:10000 in PBS-T, or peroxidase-labeled rabbit anti-mouse IgG_1, diluted 1:6000 in PBS-T.

Following another 30-60 minute incubation at room temperature, the wells were washed four times with PBS-T and each well received 100 µl of TMB substrate solution (BioFx #TMBW-0100-01). Plates were incubated in the dark at room temperature for 15 minutes and the binding reactions were stopped by the addition of 100 µl of TMB stop solution (BioFx #STPR-0100-01). The absorbance of each well was measured at 450 nm using a Molecular Devices Vmax plate reader.

Isotype was determined using a mouse immunoglobulin isotype kit obtained from Zymed Laboratories (Cat. No. 90-6550).

Immunoassay for detection of antibodies reactive with peptide 29kDa

The binding of mouse sera or MAbs to 29kDa was measured by immunoassay on wells coated with 29kDa. One hundred microliters of a 500 - 1000 ng/ml solution of 29kDa in PBS was distributed into replicate Nunc Maxisorp Stripwells and incubated overnight at room temperature. The unbound material was removed from the wells by washing four times with PBS-T. Unbound antigen was removed from the plate by washing four times with PBS-T. Antibody, diluted in PBS-T, was then added to the wells and incubated at room temperature for 30-60 minutes. After addition of the antibody, the wells were incubated at room temperature for 30-60 minutes in a draft-free environment. The wells were again washed four times with PBS-T and ninety-five microliters of detection antibody was then added to each well. The detection antibody was either peroxidase-labeled goat anti-mouse IgG (gamma-specific), diluted 1:10000 in PBS-T, or peroxidase-labeled rabbit anti-mouse IgG_1, diluted 1:6000 in PBS-T.

Following another 30-60 minute incubation at room temperature, the wells were washed four times with PBS-T and each well received 100 µl of TMB substrate solution (BioFx #TMBW-0100-01). Plates were incubated in the dark at room temperature for 15 minutes and the binding reactions were stopped by the addition of 100 µl of TMB stop solution (BioFx #STPR-0100-01). The absorbance of each well was measured at 450 nm using a Molecular Devices Vmax plate reader.
Isotype was determined using a mouse immunoglobulin isotype kit obtained from Zymed Laboratories (Cat. No. 90-6550).

Immunization of Mice for Production of Monoclonal Antibodies Reactive with Peptide 29kDa

Five female BALB/c mice, approximately 8 weeks of age, were immunized with 29kDa according to the schedule described in Table 1. All immunizations were administered subcutaneously in 50% RIBI adjuvant. Sera from the mice were tested by immunoassay, and based on the results of the assay described in Table 2, mouse 2028 was selected for hybridoma production. Mouse 2028 received a booster immunization of 50 ug of 29kDa in PBS, administered intraperitoneally, three days prior to the production of hybridomas.

TABLE 4

Immunization and Bleed Schedule for Production of Monoclonal Antibodies Reactive with Peptide 29kDa

Experimental Day		Boost (ug/mouse)	Adjuvant		Bleed
0		10 ug	RIBI		Yes
34		10 ug	RIBI		Yes
48		None			Yes
60		20 ug	RIBI		Yes
74		None			Yes
98		20 ug	RIBI		Yes

TABLE 5

Immunoassay of Day 98 Sera from Mice

Immunized with Peptide 29kDa

Mouse ID		Sera at 1:1000		Sera at 1:10000	
2026		0.260		0.078	
2027		1.415		0.306	
2028		2.184		0.383	
2029		0.838		0.107	
2030		1.073		0.154	
Buffer		0.061			

Preparation of Hybridomas Reactive with 29kDa Peptide

Hybridomas were prepared by the general methods of Shulman, Wilde and Kohler and Bartal and Hirshaut (34, 48). Mouse 2028 was selected for hybridoma production based on the results of an immunoassay and received a booster immunization of 50 ug of antigen three days prior to sacrifice. Spleenocytes from mouse 2028 were isolated and mixed with mouse myeloma cells P3X63Ag8.653 (ATCC Catalog number CRL 1580) at a ratio of 10 spleenocytes:1 myeloma. The cells were pelleted by centrifugation (400 X g, 10 minutes at room temperature) and washed in serum free medium. The supernatant was removed to near-dryness and fusion of the cell mixture was accomplished in a sterile 50 ml centrifuge conical by the addition of 1 ml of warm (37°C) polyethylene glycol (PEG; mw 1400; Boehringer Mannheim) over a period of 60-90 seconds. The PEG was diluted by slow addition of serum-free medium in successive volumes of 1, 2, 4, 8, 16 and 19 mls. The hybridoma cell suspension was gently resuspended into the medium and the cells pelleted by centrifugation (500 X g, 10 minutes at room temperature). The supernatant was removed and the cells resuspended in medium RPMI 1640, supplemented with 15% heat-inactivated fetal bovine serum, 0.05 mM hypoxanthine and 16 μM thymidine (HT medium). One hundred μl of the hybridoma cells were

planted into 952 wells of 96-well tissue culture plates. Eight wells (column 1 of plate A) received approximately 2.5 X 10^4 P3X63Ag8.653 cells in 100 µl. The P3X63Ag8.653 cells served as a control for killing by the selection medium added 24 hours later.

Twenty four hours after preparation of the hybridomas, 100 µl of RPMI 1640, supplemented with 15% heat-inactivated fetal bovine serums, 0.1 mM hypoxanthine, 0.8 µM aminopterin and 32 µM thymidine (HAT medium) was added to each well. Ninety-six hours after the preparation of the hybridomas, the P3X63Ag8.653 cells in plate A, column 1 appeared to be dead, indicating that the HAT selection medium had successfully killed the unfused P3X63Ag8.653 cells.

Ten days after the preparation of the hybridomas, supernatants from all wells were tested by ELISA for the presence of antibodies reactive with peptide 29kDa.. Based on the results of this preliminary assay, cells from 3 wells were transferred to a 24-well culture dish and expanded. Several days later, supernatants from these cultures were retested by ELISA for the presence of antibodies that bind to peptide 29kDa.

The absorbance values obtained with the supernatants from hybridoma cultures 02-100EC7, 02-100HH10 and 02-100FG5 are presented in Table 3. Based on these results, cultures 02-100EC7 and HH10 were expanded, cryopreserved and cloned by limiting dilution. Two-three clones of each culture were expanded and cryopreserved for future evaluation.

TABLE 6

Immunoassay of Supernatants from Anti-29kDa Hybridomas

Supernatants from T75 Culture Flasks

Culture ID	Culture Dilution	Detection With Anti-Mouse IgG-1	Detection With Anti-Mouse Gamma
02-100HH10	2	1.021	0.312
02-100EC7	2	0.687	0.230
02-100FG5	2	0.048	0.048
Buffer Alone		0.044	0.050

TABLE 7
LOCUS 1 (E8/B1/I16)
GATCCCGTTGTGCTTCACACCCGATAGATAGGGATTTACAGATAAATTCAGGTCTCTTCC
ACGTCATATTTGGACCCATCGAAAATTCGGGTTCTCAAATCATCGAACATAACAAAAGAA
GCTAAGCAACATGTAGGCCGTTGTCACTTAACTTCTTGTTTTTCCGATGACAGCTTCTAT
TTAGAGAATGTCATGATTATTTTATATTCACTTCAATGTTATCAATATTAGTGCCATCTA
TGACATCTGCCATGCGATTTTCTTGTAATTTTTTGTGCAATTCAAACGTGTACTTTCCAC
CGTTTTTCATTTTAATAACAATTTTACCTGAACCAACGTTACCGTACAGATTATTTTTTT
CAATAAGTTGTTTTCTCAATTTAAAATCAAGTTCTTTCAAGGAAATCTGTTCTTTAGTAA
TCTTGAATTCTGAAACATCATGAGAGATTGTACCTTTATTATCTTCCTTAGTAATTCTTA
CTCCTGCTTTGTGATCAACTTTTTTACTATTACTCTTTGTGATACCACCGACAGAATATT
TTTCCAGATTGTAATTATTTTCTTCTAAAACGACAAATACATCGACATTCCTATGTACTC
CTTCACCATATTTTTTATCATCTTTACCAACTAAAGCAATTTTATATATGAAATAATCTG
GGACAACATTCATAAATCTTATTGTCGTCCATTTTTTTAAAATAATACCAATCTCATTTT
TAAATTCTAAACTTGGTTTCGTATAATACGCTCTTAAATCTTTAAATTTAGGATTTATTT
CTGTTGGTACTTGTTTTGTGGTTGGCGATTGTGGTGTGTCTGATTTAGTAGATTGCATTG
GTTGTGGCGTGTTTGTTGATGGAGGTGTTGTCACTTTAGTTGAAGGCGGTGTTGTCGCAT
TTGCTGTTTGTTGCGGTGCTTCTACTTTAGTTGAGGGCGGTGTTGTCGCGTTTGGTTTTG
ATTGCGGTGCTTCTATTTTAGTTGAGGGCGGTGTTGATTGTGGTGCTTCCACTTTAGTGG
AAGATAGTGTTGTCGCGTTTGCTGCTTGCGTTGTCGTTGTGATTACACCTGTTGTTAAAA
GGCCTAGTGCTAAACTTGTTTTAGCAATCGTTGTTATTTTCATAGTTGTATGCTCCATTC
GTAATTATTAGATTTGTTCGATTACATTCATTGAATCATACAGCTTTATTATAGATGGCG
TATTGCTCCATTCACATTAAACCTTGTTTAACTATATTTGAATCATCGTTAAGTAAATTA
AGAAATCCATAATGTTCGTTAAATAAAAATGATTTTGATGTGATTCAACACTTGGCACAT
TTGAAGTTTCGTCACTTTTAAGACATAGAAATGCCACTTTTACAAACAAATGAATATTCG
TCTTTTTACATCATTACGCATAATAAAAGAAGCTAAGCAACATGTAAACCGTTGTCACTT
AACTTCTTGTTTTTCCGATGACAGCTTCTATTTAGAGAATGTCATGATTATTTTATATTC
ACTTCAATGTTATCAATATTAGTGCCATCTATGACGTCTGCCATACGATGCTCTTGCAGT
TTTTTGTGTAATTCAAACGTATATTTCCCACCGTTTTTCATTTTAATAACGATTGTTCCT
GAACCCATGTTACCGTAAAGATTATGTTTTTCAATAAGTTGTTTTCTCAATTTAAAATCA
AGCTCTTTCAAGGAAATCTCTTCCTTAGTAATCATGTATTCTGAAACATCGCGTGAAATC
ATACCTTGATTATCTTTTTTAGTAATGCTTAATTCTACTTTGTGATTAACTTTTTTACTA
TTAGTCTTCGTGATGCCACCGACAGAATATTTTTTCAATTGATATTTATTGTCTTCTAAA
ACGATAAATACATCGATATTATCGTAAGGTCCATCTTTATATTTTTTCTCATCTTTTCCA

ACTAAAGCTATTTTATAGATGAACCTATTTGGAATAACATTCATAAACCTAACCGTCGTC
CATGGTTTGAGCATAAATCCAAACTGCTTTTCAAATTCAAAACTCGGTTTTGTATAATAC
GCTCTTAAATCTTCATATTTAGGAGTCATATCTGTTTGTGCTTGTTTTATGGTTGGAGAT
TGTGGTGTGTCTGATTTAGTAGATTGCATTGGTTGTGGCGTGTTTGTTGATGGAGGTGTT
GTCACTTTAGTTTTCGGCGTTGTGGATTCGGTTGTCGTTTGTGATTGTTCTTGTTTAGGC
GCTGGCGTTGCTGATATATTAAGCGTTTTCTGCTCTTCTTGTTTAGGTTGTGATATTTTT
TCTATTTTGGAAGCTGAGGTTTTTTCCTCATTAGTATTTGGTGCCTTTTCGAGTTTAGGC
GTGCGTTCTTGTCTTGTGTTAGCTGCTTGTGTTGTCGCTGAATTTGCACCTGCTGTTATG
TTTATCATTGCTAATCGCTCTGCTTTAAGCGTTGGTACTTTGTCAACTTTAGTTGATTGT
ATTTTTTCTGCTTTGACCGATTGCGTCGTTACTGTAATTGCGCCTGTTGTTAAAAGCCCT
AGTGCTAAACTGGTTTTAGCAATTGTTCTCATTTTCATAATTGTATGCTCCAATCTATAT
TATATTCGATTGTCTTTTTACGTAATTTGAATCATACAACATCATTATAGATGGCGTTCT
AAGATAATCACATTAAACCCCTTTTAACAATTATTGAAGTATTATTAAGTAATTTAAGCA
AAAAATAATGAGTGAGTATGAGATTAATATAGCGTTTCTATGTGCCTTTGAAATAATTTT
TAAGCATTAAAAAGAAGTTAAGCAACGTTTGATCGTCACTTAACCTCTCTATTTCAATTT
CAACTTATTTCGTCATCAAGTATATGTGTTATGCTTTTATAACTTTGATTTCAATTCTAT
CAATATCTGTGACATTGATAACATCGGACATACGGTCTTCTTGTAACTTTTTATCCAATT
CAAATGTATACTTTCCATAGTATTTCTTTTTGACTGTAATTTTTCCTGTACTCATTTCAC
CGTAAAGACCATAATTATCAATAAGGTATTTTCTTAATTTAAAATCAATCTCTTTCAATG
ACATCGCTTCTTTATCTATTTTAAATGGGAAAAAGTCATAATCATATTCACCAGTATGAT
CTTCTTTAATAACTCTTGCTTCTGCTATTAGGTCGACAGCTTTATCGTTTGCACTCGTGA
TACCCCCAATAGAGTACTTTGCACCTTCAAATCTCTTATCCTCATTAACGTAAAATATAT
TAAGATTACGATGTACACCCGTATGATAATGTTGCTTATCTTTGCCAATTAAAGCAATAT
TATTAACAGAATTACCATCTATGATATTCATAAATTTAATACTTGGTTGAATGAAACTGA
TATAACCTGTCACATTTTTATATTCAATACTAGGTTGATTATAATAAGCTTTTAATTTTT
TGCTATTTTCACTTATTACAATAGGTTTCTTTTCGGCATGAACTGGTTTTTCCGTTGTAG
TGTTTACACCTGTTGCTAATATTCCTAATAACAAACTTATTTTTGCAATATTTTTCATTT
TCATAGTTGTATGCTCCAATCTATTATAATTAGATTGTTTTATTACGTAATTTGAATCAT
ACACCCATATTATAGGAGCTGTATTCGGATATTCACATTAACCTGTTTTTAACTATTCAT
AAAATATGATTAAGCTATTTAAGCAAAAGATC
LOCUS 2 (B10/I15)
GATCAAACTACTAATAAAAACGTTTTAGATAGTAATAAAGTTAAAGCAACTACTGAACAA
GCAAAAGCTGAGGTAAAAAATCCAACGCAAAACATTTCTGGCACTCAAGTATATCAAGAC
CCTGCTATTGTCCAACCAAAAACAGCAAATAACAAAACAGGCAATGCTCAAGTAAGTCAA
AAAGTTGATACTGCACAAGTAAATGGTGACACTCGTGCTAATCAATCAGCGACTACAAAT
AATACGCAGCCTGTTGCAAAGTCAACAAGCACTACAGCACCTAAAACTAACACTAATGTT
ACAAATGCTGGTTATAGTTTAGTTGATGATGAAGATGATAATTCAGAAAATCAAATTAAT
CCAGAATTAATTAAATCAGCTGCTAAACCTGCAGCTCTTGAAACGCAATATAAAACCGCA
GCACCTAAAGCTGCAACTACATCAGCACCTAAAGCTAAAACTGAAGCGACACCTAAAGTA
ACTACTTTTAGCGCTTCAGCACAACCAAGATCAGTTGCTGCAACACCAAAAACGAGTTTG
CCAAAATATAAACCACAAGTAAACTCTTCAATTAACGATTACATTTGTAAAAATAACTTA
AAAGCACCTAAAATTGAAGAAGATTATACATCTTACTTCCCTAAATACGCATACCGTAAC
GGCGTAGGTCGTCCTGAAGGTATCGTAGTTCATGATACAGCTAATGATCGTTCGACGATA
AATGGTGAAATTAGTTATATGAAAAATAACTATCAAAACGCATTCGTACATGCATTTGTT
GATGGGGATCGTATAATCGAAACAGCACCAACGGATTACTTATCTTGGGGTGTCGGTGCA
GTCGGTAACCCTAGATTCATCAATGTTGAAATCGTACACACACACGACTATGCTTCATTT
GCACGTTCAATGAATAACTATGCTGACTATGCAGCTACACAATTACAATATTATGGTTTA
AAACCAGACAGTGCTGAGTATGATGGAAATGGTACAGTATGGACTCACTACGCTGTAAGT
AAATATTTAGGTGGTACTGACCATGCCGATCCACATGGATATTTAAGAAGTCATAATTAT
AGTTATGATCAATTATATGACTTAATTAATGAAAAATATTTAATAAAAATGGGTAAAGTG
GCGCCATGGGGTACGCAATCTACAACTACCCCTACTACACCATCAAAACCAACAACACCG
TCGAAACCATCAACTGGTAAATTAACAGTTGCTGCAAACAATGGTGTCGCACAAATCAAA

CCAACAAATAGTGGTTTATATACTACTGTATACGACAAAACTGGTAAAGCAACTAATGAA
GTTCAAAAAACATTTGCTGTATCTAAAACAGCTACATTAGGTAATCAAAAATTCTATCTT
GTTCAAGATTACAATTCTGGTAATAAATTTGGTTGGGTTAAAGAAGGCGATGTGGTTTAC
AACACAGCTAAATCACCTGTAAATGTAAATCAATCATATTCAATCAAACCTGGTACGAAA
CTTTATACAGTACCTTGGGGTACATCTAAACAAGTTGCTGGTAGTGTGTCTGGCTCTGGA
AACCAAACATTTAAGGCTTCAAAGCAACAACAAATTGATAAATCAATTTATTTATATGGC
TCTGTGAATGGTAAATCTGGTTGGGTAAGTAAAGCATATTTAGTTGATACTGCTAAACCT
ACGCCTACACCAACACCTAAGCCATCAACACCTACAACAAATAATAAATTAACAGTTTCA
TCATTAAACGGTGTTGCTCAAATTAATGCTAAAAACAATGGCTTATTCACTACAGTTTAT
GACAAAACTGGTAAGCCAACGAAAGAAGTTCAAAAAACATTTGCTGTAACAAAAGAAGCA
AGTTTAGGTGGAAACAAATTCTACTTAGTTAAAGATTACAATAGTCCAACTTTAATTGGT
TGGGTTAAACAAGGTGACGTTATTTATAACAATGCAAAATCACCTGTAAATGTAATGCAA
ACATATACAGTAAAACCAGGCACTAAATTATATTCAGTACCTTGGGGCACTTATAAACAA
GAAGCTGGTGCAGTTTCTGGTACAGGTAACCAAACTTTTAAAGCGACTAAGCAACAACAA
ATTGATAAATCTATCTATTTATTTGGAACTGTAAATGGTAAATCTGGTTGGGTAAGTAAA
GCATATTTAGCTGTACCTGCTGCACCTAAAAAAGCAGTAGCACAACCAAAAACAGCTGTA
AAAGCTTATACTGTTACTAAACCACAAACGACTCAAACAGTTAGCAAGATTGCTCAAGTT
AAACCAAACAACACTGGTATTCGTGCTTCTGTTTATGAAAAAACAGCGAAAAACGGTGCG
AAATATGCAGACCGTACGTTCTATGTAACAAAAGAGCGTGCTCATGGTAATGAAACGTAT
GTATTATTAAACAATACAAGCCATAACATCCCATTAGGTTGGTTCAATGTAAAAGACTTA
AATGTTCAAAACTTAGGCAAAGAAGTTAAAACGACTCAAAAATATACTGTTAATAAATCA
AATAACGGCTTATCAATGGTTCCTTGGGGTACTAAAAACCAAGTCATTTTAACAGGCAAT
AACATTGCTCAAGGTACATTTAATGCAACGAAACAAGTATCTGTAGGCAAAGATGTTTAT
TTATACGGTACTATTAATAACCGCACTGGTTGGGTAAATGCAAAAGATTTAACTGCACCA
ACTGCTGTGAAACCAACTACATCAGCTGCCAAAGATTATAACTACACTTATGTAATTAAA
AATGGTAATGGTTATTACTATGTAACACCAAATTCTGATACAGCTAAATACTCATTAAAA
GCATTTAATGAACAACCATTCGCAGTTGTTAAAGAACAAGTCATTAATGGACAAACTTGG
TACTATGGTAAATTATCTAACGGTAAATTAGCATGGATTAAATCAACTGATTTAGCTAAA
GAATTAATTAAGTATAATCAAACAGGTATGACATTAAACCAAGTTGCTCAAATACAAGCT
GGTTTACAATATAAACCACAAGTACAACGTGTACCAGGTAAGTGGACAGATGCTAAATTT
AATGATGTTAAGCATGCAATGGATACGAAGCGTTTAGCTCAAGATCCAGCATTAAAATAT
CAATTCTTACGCTTAGACCAACCACAAAATATTTCTATTGATAAAATTAATCAATTCTTA
AAAGGTAAAGGTGTATTAGAAAACCAAGGTGCTGCATTTAACAAAGCTGCTCAAATGTAT
GGCATTAATGAAGTTTATCTTATCTCACATGCCCTATTAGAAACAGGTAACGGTACTTCT
CAATTAGCGAAAGGTGCAGATGTAGTGAACAACAAAGTTGTAACTAACTCAAACACGAAA
TACCATAACGTATTTGGTATTGCTGCATATGATAACGATCCTTTACGTGAAGGTATTAAA
TATGCTAAACAAGCTGGTTGGGACACAGTATCAAAAGCAATCGTTGGTGGTGCTAAATTC
ATCGGCAACTCATATGTAAAAGCTGGTCAAAATACACTTTACAAAATGAGATGGAATCCT
GCACATCCAGGAACACACCAATATGCTACAGATGTAGATTGGGCTAACATCAATGCTAAA
ATCATCAAAGGCTACTATGATAAAATTGGCGAAGTCGGCAAATACTTCGACATCCCACAA
TATAAATAAGCAACATGAACATAGGATCAAAAGTC
LOCUS 3
GATCGCAAGCCAGTTACAGTTGCAGATTTAAAAGTGGAAGGTGCACTTGCAATGATTTTA
AAAGATGCAATAAAACCAAACTTAGTACAATCAATTGAAGGGACACCTGCATTAGTTCAT
GGTGGACCATTTGCGAATATCGCACACGGTTGTAACTCAATTTTAGCAACTGAAACAGCA
CGTGATTTAGCTGATATCGTTGTAACGGAAGCTGGATTTGGTTCAGACTTAGGCGCTGAA
AAATTCATGGACATTAAAGCGCGTGAAGCAGGATTTGATCCGGCAGCTGTCGTTGTTGTT
GCGACAATTCGTGCGTTAAAAATGCATGGTGGTGTAGCGAAAGATAATTTAAAAGAAGAA
AATGTAGAAGCAGTAAAAGCAGGAATTGTTAATTTAGAGCGTCATGTTAATAATATTAAA
AAATTCGGTGTAGAACCGGTTGTTGCAATTAATGCATTTATACATGATACCGATGCAGAA
GTAGAATATGTAAAATCTTGGGCTAAAGAAAATAACGTACGAATTGCCTTAACTGAAGTT

TGGGAAAAAGGTGGTAAAGGTGGCGTTGACTTAGCAAATGAAGTATTAGAAGTCATTGAT
CAACCTAATTCATTTAAACCTTTATATGAATTAGAATTACCATTAGAGCAAAAGATTGAA
AAGATTGTGACTGAAATCTATGGCGGTTCAAAAGTAACGTTTAGCAGTAAAGCGCAAAAA
CAATTAAAACAATTTAAAGAAAATGGTTGGGATAATTACCCAGTATGTATGGCGAAAACA
CAATATTCATTCTCAGATGATCAAACGTTGTTAGGTGCACCATCAGGATTTGAAATTACA
ATTCGTGAATTAGAAGCGAAAACAGGTGCAGGATTTATCGTAGCGTTGACAGGTGCAATC
ATGACTATGCCTGGTTTACCTAAAAAACCAGCAGCATTAAACATGGATGTTACTGATGAT
GGTCATGCAATTGGGTTATTCTAATAAATCATGTCAATTGTTTAATAAAGATAAGTAAAT
AGTTTAATAGACCGGACTGTTGGAGATGCATTATTTCAGCAGTTCGGTTTTTTGCTGTGC
TAAAAATAGATTCAATTTGGCGAATCTAACGACAATGTTTGAAGGTGGTTAATTAATGTA
TATGAAGATAAAAAGTGGGCTTGAAGAATAGGAAAGCGATGCAATGAATATTCCATATTA
AAAAAAATTAATAAAATAGGTTGCAATATTTAATTGGGATGCGCTACAATTAACACTAAT
AATTGATATTGATAATTATTATCAATTAAATATAATCTTATAGGAGTTGTTAACAACATG
AACAAACATCACCCAAAATTAAGGTCTTTCTATTCTATTAGAAAATCAACTCTAGGCGTT
GCATCGGTCATTGTCAGTACACTATTTTTAATTACTTCTCAACATCAAGCACAAGCAGCA
GAAAATACAAATACTTCAGATAAAATCTCGGAAAATCAAAATAATAATGCAACTACAACT
CAGCCACCTAAGGATACAAATCAAACACAACCTGCTACGCAACCAGCAAACACTGCGAAA
AACTATCCTGCAGCGGATGAATCACTTAAAGATGCAATTAAAGATCCTGCATTAGAAAAT
AAAGAACATGATATAGGTCCAAGAGAACAAGTCAATTTCCAGTTATTAGATAAAAACAAT
GAAACGCAGTACTATCACTTTTTCAGCATCAAAGATCCAGCAGATGTGTATTACACTAAA
AAGAAAGCAGAAGTTGAATTAGACATCAATACTGCTTCAACATGGAAGAAGTTTGAAGTC
TATGAAAACAATCAAAAATTGCCAGTGAGACTTGTATCATATAGTCCTGTACCAGAAGAC
CATGCCTATATTCGATTCCCAGTTTCAGATGGCACACAAGAATTGAAAATTGTTTCTTCG
ACTCAAATTGATGATGGAGAAGAAACAAATTATGATTATACTAAATTAGTATTTGCTAAA
CCTATTTATAACGATCCTTCACTTGTAAAATCAGATACAAATGATGCAGTAGTAACGAAT
GATCAATCAAGTTCAGTCGCAAGTAATCAAACAAACACGAATACATCTAATCAAAATATA
TCAACGATCAACAATGCTAATAATCAACCGCAGGCAACGACCAATATGAGTCAACCTGCA
CAACCAAAATCGTCAACGAATGCAGATCAAGCGTCAAGCCAACCAGCTCATGAAACAAAT
TCTAATGGTAATACTAACGATAAAACGAATGAGTCAAGTAATCAGTCGGATGTTAATCAA
CAGTATCCACCAGCAGATGAATCACTACAAGATGCAATTAAAAACCCGGCTATCATCGAT
AAAGAACATACAGCTGATAATTGGCGACCAATTGATTTTCAAATGAAAAATGATAAAGGT
GAAAGACAGTTCTATCATTATGCTAGTACTGTTGAACCAGCAACTGTCATTTTTACAAAA
ACAGGACCAATAATTGAATTAGGTTTAAAGACAGCTTCAACATGGAAGAAATTTGAAGTT
TATGAAGGTGACAAAAAGTTACCAGTCGAATTAGTATCATATGATTCTGATAAAGATTAT
GCCTATATTCGTTTCCCAGTATCTAATGGTACGAGAGAAGTTAAAATTGTGTCATCTATT
GAATATGGTGAGAACATCCATGAAGACTATGATTATACGCTAATGGTCTTTGCACAGCCT
ATTACTAATAACCCAGACGACTATGTGGATGAAGAAACATACAATTTACAAAAATTATTA
GCTCCGTATCACAAAGCTAAAACGTTAGAAAGACAAGTTTATGAATTAGAAAAATTACAA
GAGAAATTGCCAGAAAAATATAAGGCGGAATATAAAAAGAAATTAGATCAAACTAGAGTA
GAGTTAGCTGATCAAGTTAAATCAGCAGTGACGGAATTTGAAAATGTTACACCTACAAAT
GATCAATTAACAGATTTACAAGAAGCGCATTTTGTTGTTTTTGAAAGTGAAGAAAATAGT
GAGTCAGTTATGGACGGCTTTGTTGAACATCCATTCTATACAGCAACTTTAAATGGTCAA
AAATATGTAGTGATGAAAACAAAGGATGACAGTTACTGGAAAGATTTAATTGTAGAAGGT
AAACGTGTCACTACTGTTTCTAAAGATCCTAAAAATAATTCTAGAACGCTGATTTTCCCA
TATATACCTGACAAAGCAGTTTACAATGCGATTGTTAAAGTCGTTGTGGCAAACATTGGT
TATGAAGGTCAATATCATGTCAGAATTATAAATCAGGATATCAATACAAAAGATGATGAT
ACATCACAAAATAACACGAGTGAACCGCTAAATGTACAAACAGGACAAGAAGGTAAGGTT
GCTGATACAGATGTAGCTGAAAATAGCAGCACTGCAACAAATCCTAAAGATGCGTCTGAT
AAAGCAGATGTGATAGAACCAGAGTCTGACGTGGTTAAAGATGCTGATAATAATATTGAT
AAAGATGTGCAACATGATGTTGATCATTTATCCGATATGTCGGATAATAATCACTTCGAT
AAATATGATTTAAAAGAAATGGATACTCAAATTGCCAAAGATACTGATAGAAATGTGGAT
AAAGATGCCGATAATAGCGTTGGTATGTCATCTAATGTCGATACTGATAAAGACTCTAAT
AAAAATAAAGACAAAGTCATACAGCTGAATCATATTGCCGATAAAAATAATCATACTGGA
AAAGCAGCAAAGCTTGACGTAGTGAAACAAAATTATAATAATACAGACAAAGTTACTGAC

AAAAAAACAACTGAACATCTGCCGAGTGATATTCATAAAACTGTAGATAAAACAGTGAAA
ACAAAAGAAAAAGCCGGCACACCATCGAAAGAAAACAAACTTAGTCAATCTAAAATGCTA
CCAAAAACTGGAGAAACAACTTCAAGCCAATCATGGTGGGGCTTATATGCGTTATTAGGT
ATGTTAGCTTTATTCATTCCTAAATTCAGAAAAGAATCTAAATAATTAACTAAATATAGC
ATATGTATGATTAACTTTGTAGACAATGTGAAAGCAATTAATTTATAAACTATTGATTGG
TTTAATGGCTTTCCTTTAGAGTAAATAAAAAGAACAGCAGTGAGAAATTTTCTAATTGAA
AATAATCTTACTGCTGTTTTTAATATTTGGATTCATTGTTGTGGTTACTTTAAAAAGTGA
GCATCAATTAACGCTTTTTTCGATTTAACAAATGTGATTTAATATCATATTTTAATGCGT
CGTTGTATTCTTTTTCAGTGATTTGATCTTCGATTAACATACGCTTTAATACATAATGTT
GTCTTTGAATACTATATTTCAAATCTTTATCCGATTTTAACGTTCCATCTTTTTCGTAGG
GTGTATAGCCATATGGGCTTTGCAACAAACCGATAAGGTATGCAGATTGTGCAATTGATA
AATCTTTTGGTGGAATACCAAATAGACTATATGAAGCGGATGCAATTCCGGAAATATTAG
CGCCATTATAATCTCTACCGAAGGGAACTATATTTAAATATGTATATATAATTTCATCTT
TTGAGAGTAGGTGTTCTAATCTAATTGCTAGGCGAAGTTCATTTGCTTTTCTACTATATG
TTTTTTCGTTGGTAAGAACTTGATTTTTAACAAGTTGTTGTGTAATTGTGCTACCACCTG
AACTTTGATCAGTATTAAAAATA
LOCUS 4 (E103)
CAAAGTTAATGTGCTCCTTTTCCTAAGTATTAAATCTATGTATCAACGTCATTTTAACAC
TAATTAGAACGCCTTCATAGTGTCATTGAGTATGTAATTATTTCTTGGGAAATTTGTTTT
AATTTTAAAAAACAGGCTTACTTCATATAATTTATGAAATAAACCTGTCAATTTTGGATT
GATTATGCTTTGTGATTCTTTTTATTTCTGCGTAATAACGCTAAACCTAAAATGCTAAAT
AATCCGCCGAACAACATGCCGTTGTTTGTTGATTCTTCTCCACCTGTTTCAGGTAGTTCA
GATTTCTTAGATTGTGCTTTTTTAGTTGGTACCACTGCTTTAACCTTTTCATTGATTTCA
ATAACAGGTGTTACTACTTTACCTTGTTCCACTGGTTTAGAAGGTTTTTTAGGTTCTTCT
TTAGCAGGTGGTATTGGTTTACCAGGTTCAGTTGGTACCTCTGGCGTTGGCGGTGTTGGT
GTTTCCGGCTCGCTTGGTACTTCTGGTGTCGGTGGTGTTGGTGTTTCCGGCTCGCTTGGT
ACTTCTGGTGTCGGTGGCGTTGGTGGCACGATTGGAGGTGTTGTATCTTCTTCAATCGTT
TGTTGACCTTCATTATGACCACTTACTTGTGGAAGTGTATCTTCTTCAAAGTCAACACTA
TTGTGTCCACCGAATTGATAATTTGGTTTATCTTTATTTGTATCTTCTTCAATAATTTCA
GTGTGCTTATTGAATCCGTGAATATGTGGCACACTGTCGAAGTCGATATCAATGATATTA
CCACCTTGTTCATACTTAGGTTTGTCTTTCTCTGTATCTTCTTCGAATGATTGGTTACCA
TTATTTTGACCATGAATTTGAGGTACACTATCGAAATCGATATCTACGATATTGCCACCT
TGTTCATATTTCGGTTTATCTTCTTCTGTGTCTTCCTCAAATGACTGATTACCGCTATTT
TGGCCACCTTCGTAACCTAATTCACTCTTAATATCCACGTGGCTATTTTCTTCGATTTCT
TCAATCACGCCATAATTACCGTGACCATTTTCAGTTCCTAAACCAGAATGAGAAATATGA
TGATTGTTTTCAGTAATTTCCTCGATTGGTCCTTGCGCTTGACCATGTTCTTCAGGTAGT
TCATCTACTAGTTCAATCAGATTACTTTCAGTCGTATATTCTTTCGTATCTTCAATTGTT
GTATGATCGCTAACAGCACCAGTTACAATACCTTTTGTAGAATCTTCGTCAAATTCAACT
AGGTTAGACTCAGTAGTAACCTGACCACCACCTGGGTTTGTATCTTCTTCATATTCAACA
ACATCAGCATGATGTTTTGAATTTTCATGTGTCGATTCTTCAAAGTCTACATGAATAGAA
TCTTCTTCAGTTTCAATGGTACCTTCTGCATGACCTTCTGCACCTTCAACAGCTGTATGA
TATTCAAAATCAATTGGCTTAGAATCATTACTTTCTTCGATTGTACCAGTCAATTCATGC
TTCTCCACTGGCGGCTCTGATTTAAATTCAAGTTCGATAGGAGTACTATGTTCTATAATA
GGTTCCTTTAGTTTATCTTTGCCGTCGCCTTGAGCGTTATTAGAGTAAAATGCAACGCCA
TTTTTCCAAGTTAAATTACTTGTATAATAATAGTTATAATATCCAAAAAGGTGTGTTTGA
AATTCTAAGTTGCTAGCATTTGAATCATAATACCCTTCATATTTTATTACATAATTTTTA
CTTTGGTCTAAATTATTAAAGTTTAAAGAATAACCACCATTAGTATCAAAATCTAAACTC
ATATTATCAGTCACATCTTCAAATTTGCTGACATCATCAAGCTTTGCATATACGCTTTCA
GCTAAATCGTCTGAACCAATGTGTTTATATACCTTAACTGTTGGATTATTAACCCCTGGT
TTATTTCCTTTAGTTACTTGACCAGTTACTGTCACAGAGCTTAACGACTGGTTGTTAGGT
TTCATGTACGCAAAATGACTAAATTTCCCATCTACTTTATTTAAAGTATCAATTCGACCA

TTAGCTGTTACTCCCCAATTATCTCTAACTCCACCTAAATATTGAATATTAAATATTTTG
CTAACCGTAGTCTCACCCAATTTAACTTCAACATTTTGGTTACCTTTTTGCGTCACTGTT
GTAGGATCAATAAATAGATTTAAAGATAATTCAGCAGTTAAATCTTTCTTTTCTTGTACA
TATTCTTTAAACGTATATCTAACTTTTCTTTCTCCAATTATTTCTCCTGTCGCCATAACT
TGACCATCTGTACTTTTTATCTCCGGAACTTTACGCAGTGTTGAGATACCATGAGTTTCA
ACATTATCGCTTAATGTGAAATCAAAATAATCTCCCGCCTTAATTCCTTCTCCAAATTTC
CATTTATATTTCAAGGTTACTCTTTCTGCGTTATGAGGATTTACAACATTCGTATCTTGT
TTATGTCCTACAATTTCACTACCTTCTTCTACTTCCACTTTATTTGTTACATCTGTACCT
GTCGCTTTAGTTTCTTCCACTACTTCTTTCTCTGCAACTGCTGTAACGTCAGTTGATCTT
TTCATTCTTGGTTTAATTTCTGAGACGTTACTTGGTTGAGCTATGTCAACTTGAGTTCCT
GTAGTTTCCTTATCAGCAACTTTTTCCGATGGCAAATCAACTCGCGAAGTTTCTACTTTT
GGTGCTTGCACAGTTTTCGGTGCTTCTTCTGTTGTTACTTGTGTTGATTGTGATGGTTGC
TCAGTTGATGTCGCGCTGTATGATTGTGTTTCATCTATTGTATTAACGTTATTTGTAGTT
GTTTGTGTTTCGCTTGCTTTACTTTCAGTAGCTGAACTCCCACTTTCCTCTACTGTAGTA
TTGTTTTGTTCCGATGCTGCAGCTTCTTTTTCTTGTCCCATTCCAACAACGATCATTGTT
CCTAAGAATACTGAGGCCGCTCCCAATTTGTGTTTTCTTATGCCGTATCTAAGATTGCTT
TTCACTATAATATTCTCCCTTAAATGCAAAATTCATTTATTTTTAAAACTCAATAAATGC
AATTCTATATTGTTCGGTTTTTAAAAGCAATGAAAAAAAGCGAGTTAATAAAAAGTTAAG
ATTGTTGTTAACTTTATGTATAATGAGTTTTTTATTATTTGAAACTCACATATATATTGC
ATACAAAGCTCTTGAACACCTTGATATAACAGGCTTGTATTTTTTATACTTACTTTTTAA
ATTAAATTCAAATTCATCTAATTTAAAACAATATACTAAACCATACATAATAATCGCCTG
TACAATGCATCATTAACAAGTCACTGAAACGCCTTTCATTGTATTAATAACGTCACTATA
ATTTTTATATCGTTCGGTTTTTGTTTGATTTTAATGATTATTTATACAAAAACAGCCGTA
TTTCAAGCCGACATTTTAAATTTAACTAAATTTGCATCTAGTTAATAATTGCATTTATCA
AATTTGTCTTATTGATCCAATCTAATTTGTACTCACAAACTAGTTTAAAATTCTAACTTT
ATCTCTCAGTTCGTTATCAATCATCAGACATAAACCAATGAAGCAATCAGAAAACACTCT
AATTTTCTATTAGAAATTTGATTTAATATAAAAAAACAGGCTTACTTCATATAATTTATG
AAATAAACCCGTCAATTTTTGTTTAATTATGCTTTGTGATTCTTTTTATTTCTGCGTAAT
AATGCTAAACCTAGAATGCTGAATAATCCGCCGAACAACATACCTTTGTTTGTTGATTCT
TCTCCACCTGTTTCAGGTAGTTCAGATTTCTTAGATTGTGGTTTTTTAGTTGGTGCCACT
GCTTTAACCTTTTCATTGATTTCAATAACAGGTGTTACTACTTTACCTTGTTCCACTGGT
TTAGAAGGCTTTTTAGGTTCTTCTTTGGCAGGTGGTACTGGTTTACCAGGTTCAGCTGGT
ACCTCTGGTGTTGGCGGTGTTGGAGTTTCTGGCTCACTCGGCACTTCTGGTGTCGGTGGT
GTTGGTGTTTCCGGCTCACTTGGTACTTCTGGTGTTGGTGGCGTTGGTGTTTCCGGCTCA
CTTGGTACTTCTGGTGTCGGTGGCGTTGGTGGCACGATTGGAGGTGTTGTATCTTCTTCA
ATCGTTTGTTGACCTTCATTTTGGCCGCTTACTTTTGGAAGTGTATCTTCTTCAAAGTCA
ACACTATTGTGTCCACCGAATTGATAACTTGGTTTATCTTTATTTGTATCTTCTTCAATA
ATTTCAGTGTGCTTATTGAATCCGTGAATATGTGGCACACTGTCGAAGTCGATATCAATG
ATGTTACCGCCATGTTCATACTTAGGTTTGTCTTTTTCTGTATCTTCCTCGAATGACTGA
TTACCTTTATTTTGACCATGAATTTGAGGTACACTATCAAAATCGATATCTACGATATTG
CCACCTTGTTCATATTTAGGTTTGTCTTCTTCTGTGTCTTCCTCGAATGACTGGTTACCG
CTATTTTGGCCACCTTCATAACCTAATTCACTCTTAATATCAACGTGGCTATTTTCTTCG
ATTTCTTCAATCACGTCATAATTCCCGTGACCATTTTCAGTTCCTAAACCAGAATGAGAA
ATATGATGATTGTTTTTAGTAATTTCCTCGACTGGTCCTTGTGCTTGACCATGCTCTTCA
GGTAATTCATCCACTAATTCAATCAGATTACTTTCAGTTGTATATTCTTTCGTATCTTCA
ACTGTTGTATGATCGCTCACTGCGCCAGTTACAATACCTTTTGTAGACTCTTCGTCAAAT
TCAACTAAGTTAGACTCAGTAGTAACCTGACCACCACCTGGGTTTGTATCTTCTTCATAT
TCAACAACATCAGCGTGATGTTTTGAATTTTCATGTGTAGATTCTTCAAAGTCAATTGGA
TTTGATTCCTCAGAGGACTCAGTGTATCCTCCAACGTGACCTGCTTCGCTATCCACAGCA
GTATGGTAATCGATATCAATAGCTGATGAATCCGTTTCTTCTATTGTTTCAATGTATCCA
TCAACATATCCACCTCCACCATCTATAGCTGTGTGGTAATCAATGTCAAGAGTTGATGAA
TCATATTCCTCTTCAACAGTAGTTACTAAATTCTTATCATATTGACCTGTAAGAGTTTCT
TTAATTGTATCTTCTTTATATTCAAATTTATTATTTTGAATAATCGGACCATTTTTCTCA
TTTCCGTTCGCTTTATTACTGTATAAAACTAAACCATTATCCCAAGTTAAGGTATATCCT

CTATCATAATAATACTTATAAAGTTGCTCTGGATGTCCTACCATTTGTGTTCTAAAATCA
ACTTCATCAGTACCATTTAAATACTCTCCATCATAGTGAACAACATAAGTTTTATCTAGA
TTTTCTATATTCAATGAATAGCTTCCATTATTTTGTAAATTCAAATTCCCACTCATATTA
CTTGTGACTTCTTTAAATTTAGAAGTATCTGTCGTATTTGCATATACACTCTTCGCTATG
TCTTCATTATTACCCAAGTATTCAAATATCCTAACTTTTGGTTGATTTCCATTCTGATTA
CTACCTTTCATTAAAGTTCCAGTAACAGTCACACTTGTCGTTTTACCATTATTAGGTTTA
ATAAATGCAACATGCGAAAATCTATTATTCGCTTTATTAAATGTCTCAAT
LOCUS 5 (L4)
GATCAACAAAAAGCTTTTTATCAAGTATTACATCTAAAAGGTATCACAGAAGAACAACGT
AACCAATACATCAAAACATTACGCGAACACCCAGAACGTGCACAAGAAGTATTCTCTGAA
TCACTTAAAGACAGCAAGAACCCAGACCGACGTGTTGCACAACAAAACGCTTTTTACAAT
GTTCTTAAAAATGATAACTTAACTGAACAAGAAAAAAATAATTACATTGCACAAATTAAA
GAAAACCCTGATAGAAGCCAACAAGTTTGGGTAGAATCAGTACAATCTTCTAAAGCTAAA
GAACGTCAAAATATTGAAAATGCGGATAAAGCAATTAAAGATTTCCAAGATAACAAAGCA
CCACACGATAAATCAGCAGCATATGAAGCTAACTCAAAATTACCTAAAGATTTACGTGAT
AAAAACAACCGCTTTGTAGAAAAAGTTTCAATTGAAAAAGCAATCGTTCGTCATGATGAG
CGTGTGAAATCAGCAAATGATGCAATCTCAAAATTAAATGAAAAAGATTCAATTGAAAAC
AGACGTTTAGCACAACGTGAAGTTAACAAAGCACCTATGGATGTAAAAGAGCATTTACAG
AAACAATTAGACGCATTAGTTGCTCAAAAAGATGCTGAAAAGAAAGTGGCGCCAAAAGTT
GAGGCTCCTCAAATTCAATCACCACAAATTGAAAAACCTAAAGTAGAATCACCAAAAGTT
GAAGTCCCTCAAATTCAATCACCAAAAGTTGAGGTTCCTCAATCTAAATTATTAGGTTAC
TACCAATCATTAAAAGATTCATTTAACTATGGTTACAAGTATTTAACAGATACTTATAAA
AGCTATAAAGAAAAATATGATACAGCAAAGTACTACTATAATACGTACTATAAATACAAA
GGTGCGATTGATCAAACAGTATTAACAGTACTAGGTAGTGGTTCTAAATCTTACATCCAA
CCATTGAAAGTTGATGATAAAAACGGCTACTTAGCTAAATCATATGCACAAGTAAGAAAC
TATGTAACTGAGTCAATCAATACTGGTAAAGTATTATATACTTTCTACCAAAACCCAACA
TTAGTAAAAACAGCTATTAAAGCTCAAGAAACTGCATCATCAATCAAAAATACATTAAGT
AATTTATTATCATTCTGGAAATAATCAATCAAAAATATCTTCTCTAGTTTTACATCATTT
TTTAAATAATTTTCGTAACAAACCGTGATTAAAAAGAACCGTTGATTCTCAATCGAATCT
ACGGTTCTTTTTTCATTTTCCATCAATTAAATGCTTCTTCGCTATTTGTCAGCCCACTTT
TTTACCTGCAACTTGTTAAATAATCCTTACATCGTTAACGAATAGTTCATCATTTAGTTG
AATCAGCTCAACTTTATTAACTTCATATTTTCACAAACTATTGCGCAATCCATTCCTTTT
CCACTACAAGCACCATAATTAAACAACAATTCAATAAAATAAGACTTGCAAAGCATAGTT
ATGTAGCTATATAAACGCCTGCGACCAATAAATCTTTTAAACATAACATAATGCAAAAAC
ATCATTTAACAATGCTAAAAATGTCTCTTCAATACATGTTGATAGTAATTAACTTTTAAC
GAACAGTTAATTCGAAAACGCTTACAAATGGATTATTATATATATGAACTTAAAATTAAA
TAGAAAGAAAGTGATTTCTATGATTAAAAATAAAATATTAACAGCAACTTTAGCAGTTGG
TTTAATAGCCCCTTTAGCCAATCCATTTATAGAAATTTCTAAAGCAGAAAATAAGATAGA
AGATATCGGCCAAGGTGCAGAAATCATCAAAAGAACACAAGACATTACTAGCAAACGATT
AGCTATAACTCAAAACATTCAATTTGATTTTGTAAAAGATAAAAAATATAACAAAGATGC
CCTAGTTGTTAAGATGCAAGGCTTCATTAGCTCTAGAACAACATATTCAGACTTAAAAAA
ATATCCATATATTAAAAGAATGATATGGCCATTTCAATATAATATCAGTTTGAAAACGAA
AGACTCTAATGTTGATTTAATTAATTATCTTCCTAAAAATAAAATTGATTCAGCAGATGT
TAGTCAGAAATTAGGCTATAATATCGGCGGAAACTTCCAATCAGCGCCATCAATCGGAGG
CAGTGGCTCATTCAACTACTCTAAAACAATTAGTTATAATCAAAAAAACTATGTTACTGA
AGTAGAAAGTCAGAACTCTAAAGGTGTTAAATGGGGAGTGAAAGCAAATTCATTCGTTAC
ACCGAATGGTCAAGTATCTGCATATGATCAATACTTATTTGCACAAGACCCAACTGGTCC
AGCAGCACGAGACTATTTCGTCCCAGATAATCAACTACCTCCTTTAATTCAAAGTGGCTT
TAATCCATCATTTATTACAACATTGTCACACGAAAGAGGTAAAGGTGATAAAAGCGAGTT
TGAAATCACTTACGGCAGAAACATGGATGCTACATATGCTTACGTGACAAGACATCGTTT

AGCCGTTGATAGAAAACATGATGCTTTTAAAAACCGAAACGTTACAGTTAAATATGAAGT
GAACTGGAAAACACATGAAGTAAAAATTAAAAGCATCACACCTAAGTAAACAGTTCAATC
ATCTTAAAAAATCCTGGGACACTTCATACTTGTCTCAGGATTTTTTAACAAATTGAATCA
GCCTCATAACATTAAATTATTTTATCGTACATTAAATTTAATAATAACAACTGATTTTTA
TAAGAATAAAGTATCGAACCATAGTAGATACACAAATAATACAAATGAAACAATTTAACT
TGAAAGCTTAAATAAATATTATCAAGTTAATAAACAATTAATTTTTAGATGGATTCATCA
AAAATCGTAAAAAAGCACAATTTGTATTTTACAAACATTAATTAAAAAAGAAAGCAAGAC
ATTCGTGCAATCGGTTACCTTAAATTGTTTACAACTGTCAACAATACCAAGGTTTTATTA
ACTATATTTCTCACAAAATTAGCTTTTAGCATTCCAAACAAAAAAGGTTAAATCGAACGG
AATTATGGCATTTTTAACTTAATTGTAAAAAAAGTTGATAATGGTCAATTGTTAATGAAC
AGTTAATTATAATAACGCCCAAAATATATTATTATTTAATTAAGTTAAATAAAATTATAG
AAAGAAAGTGAAACTTATGCTTAAAAATAAAATATTAACTACAACTTTATCTGTGAGCTT
ACTTGCCCCTCTTGCCAATCCGTTATTAGAAAATGCTAAAGCTGCTAACGATACTGAAGA
CATCGGTAAAGGAAGCGATATAGAAATTATCAAAAGGACAGAAGATAAAACAAGTAATAA
ATGGGGCGTGACTCAAAATATTCAATTTGATTTTGTAAAGGATAAAAAATATAACAAAGA
TGCTTTGATATTAAAGATGCAAGGATTCATTAGCTCTAGAACAACATATTACAACTATAA
AAAAACTAATCATGTTAAAGCTATGCGATGGCCATTCCAATATAATATTGGTTTAAAAAC
AAATGATAAATATGTTTCTTTAATTAATTATTTACCTAAAAATAAAATTGAATCTACAAA
CGTGAGTCAGACATTAGGATACAATATCGGTGGTAATTTCCAATCAGCCCCATCACTCGG
TGGTAATGGATCATTTAACTATTCTAAATCGATTAGCTATACAC
LOCUS 6 (D1)
GATCATATAAATAGTGTTTAGATGCTATAGTCGGATGCTTAAGTAATTTAAAGAAAGTAT
CTTTAACATCGATGTGTGTATAATCATTTTTAGAAGTATTATAATCTTTTTTCTTCTCCTT
CTAAAATATATACAGGTGCTTCATCAGCTAGTGGTTCAACTGGAATGTCAGCATAAACTT
CGTCATCATATGTTAAAACAAAACGATTTGTATCTGTAACTTCACCTATAACAGCACTAT
CCAATTCGTGCTTATCAAATAAATCTAAGAATTTTTGTTCAGTACCTTTTTTCAACAACTA
GTAACATACGTTCTTGAGTTTCTGAAAGCATCATTTCATAAGGAGAAATACCTGGCTCAC
GTGTTGGCACTTGTTCTAATCTCAAATGTAACCCACTACCACCTTTTGCCGCCATTTCAG
ACGATGAAGATGTTAAACCAGCAGCACCCATATCTTGAATACCAACTAATTCATCAAATG
TAATTGCTTCAAGTGTTGCTTCCATTAATTTTTTACCTACAAATGGATCACCGATTTGTA
CAGAAGGTCGTTTACTTTCGCTTTCTTCCGTCAATTCTTCAGATGCAAAAGTAGCACCAT
GAATACCATCTCGACCAGTTTTCAAACCAACATAAATGACCGAATTACCTACACCTTTTG
CTGTGCCTTTTTGAATCATGTCGTGATTGATAACACCAACACACATTGCATTAACAAGTG
GATTGCCATCATAACGTTCATCAAATTCGATTTCACCAGCAGTTGTTGGAATACCAATGC
AGTTACCATAACCTCCGATACCCTTTACAACACCTTTAAGTAATCTTTGGTTTTGTTTAT
TATCTAATTCTCCAAATCTAAGACTGTTTAACAAATTAATAGGTCTAGCCCCAATAGAGA
CAATGTCACGAATGATTCCACCAACGCCTGTAGCAGCCCCTTGATATGGTTCAATTGCTG
ATGGATGATTGTGAGACTCTACTTTAAATACTACGGCTTGATTATCACCTATATCGACTA
CCCCTGCACCTTCACCAGGCCCCATAAGCACATGGTCACCTGACGTAGGAAATTGCTTTA
AAAACGGTTTAGAATGTTTATAAGAGCAATGTTCACTCCACATAACAGAAAAGATACCTG
TTTCTGTAAAGTTAGGTTGTCTGCCTAAAATATCGCAAACTTTTTCATATTCTTGATCAC
TTAATCCCATATCTTGATATACTTTTTCAAGTTTAATTTCTTCAACGCTTGGTTCGATAA
ATTTAGACATGTTGTTCCCTCCAACTTTTTACCATCGCTTCAAATAATTTCACACCACTA
TCAGTACCTAACAACGTTTCTAAAGCTCTTTCAGGATGTGGCATCATGCCACATACATTG
CCTTTTTCGTTAACAATTCCTGCAATATCATCATATGAACCGTTCGGATTATTCACATAT
TTCAGAATAATTTGATTGTTAGCTTTTAATTGTTGATATATTTCATCAGTACAATAATAA
TGACCTTCACCGTGAGCTACAGGATATATAACTTTTTCACCTTGTTCATAAAGATTTGTA
AATGCCGTTTGATTATTCACTATTTCTAACTCTTCATTTCTACTAATAAATAAATGTGAA
TCGTTATGCAATAATGCACCAGGTAATAAGCCTATTTCAGTTAAAATTTGAAACCCATTA
CAAACACCTAATACT
LOCUS 7 (D3)

TTCAATTTCTTCTAATTCCATTCTGTAGCCATTCAATTTGATTTGGAAATCAATACGACC
TTGAATGAACCATTGACCATTTTCAAACTTCGCTTTATCACCAGTGTGATATGTACGAAT
ACCGTCATCGAAATTAAATACTTCAGCTGTTTTTTGGTCATTTTTTAAGTATCCTAAACT
TACACTTTGACCTTCGATAACAAGTTCACCTTCATCTGTAGTAGATAATCTTGCGCCTGG
TCTTTCAACGCCAACAGGTAATGTCGGATATTGATCTAAGATTTCTTGTGTAATTTGAAT
ACTTGTAACTGCTACCGTAGCTTCAGTTGGACCATATGTGTTGTAAATCGTCGCACTTGG
GAAACGGTTTACTAACGCTTTTGCTGCTCTGTGAGGTAGAATTTCACCACAGAAGAAGAA
TTCGTTAAGACTACCATATTGTTCTTCATTAAGCGTTGGTAATAATAAACACATTTCCAT
AAATGATGGTGTTGATACCCAAATGTTAATCGGTGTTGCTGTTAGCATTTCATTTAATAA
TTTAGGTTTATTAATCATGTTTTTATCTACAAGATTTAATGTACCGCCTGATGCTAAACA
TGGATAAATAGCCATTACAGATAAATCAAATGAAAATGGCGCTTGGTTAAGCCATTGTTG
TTCATTTCCTGATTTATTAAGTTCTAACATCCACTCAGTAAATTGAACTAAACTTGCATA
TTCAATTTGAACACCTTTAGGTTCCCCAGTAGAACCAGATGTAAAGATTGTGTATACTGT
GTCGTTATCTTTAATCTGACTATCAAAAATTACTGGGTCTTGAGATGTTTTAATATCTTC
TATTGTAAATACTTCGCCTTCTAAACTTTCAAATGATTCATCAGTCGTATTAAATACAAA
CTCTGGTTGAACCTTGTTAATAATCATTTTAATACGGTCTTCAGGAATTGAAGTGTCTAC
AGGTACATATCCACATCCTGCTTTAATGGCACCAATCATCCCAACAATCATATATGGTGA
CATGTGACCGAATAAAATCATCGGTTTCTTACTACCTTGTAATCGATGTGCTAATTTACT
AGACTCATCCATTAACTGTTGATAAGTTAATTCATCAGTTGTGTGTCTAACAGCAATGCT
TTGTGGATTTGCATCCGCAAACGCTTGCAGCTTGTTAATAATATCTGTCATATTAAGTCT
CCCTCATTAGAACTCATTATAAATGAAGTTATTGTGTGTGTCGCCACTGCCATAAATTAA
ATATAAAGTAATAAATATTGCCAAATACAATAGTGTTAATAAATATGGTTTGAATGCTTC
AACATATTTATTAGGTGGCTGTTTACTTTTAGATTTCATATTGCACCTCTTAAAGTTCTT
AGTAAAAACGCCTTTATAAAGACCGTTCAATATAAAATACGTTTTAAAATTTGTTTTTTA
CAATTCATTATATCGATATTCATAATGAAATTCAATTTTAATTTTATAGATTCAACATAG
TAATTGGTTGTCATCACTCAATTATTGTAAATGATACACTTTGTTGAGAACATCATTCAT
TTTAAAGGTTATTTAAACAATAAACAATTACAGTCTATATAACAATTTTGTTATATACGT
CAAAATCAAATAAACTCATCACATTAATATGACGAGTTTATAATGTTATTGAATTATCAT
CAGCGCAAATATATACATTCGCAAGTCAAGCATAACATATTTAACAATTGCTTTGCTTGT
TTTACCAATGATTAAAAACCATACTTATTTTCAATTTACTGGAGTATGTGGTACCTGATT
TGTCATAACCGCTTCTATATTATTAATACATAATTGAATCATATTGTCCCGTGTTGTTAC
TGATGCGCTACCAATGTGTGGTGTAATCAGAACATTATCACGTCCCATTAATGGATGTGT
ATG
LOCUS 8 (D4)
TGATCCAAATATTCACCAAGCTGTAGTTCAAGATGATAACCCTGATTTTGAATCTGGCGA
AATCACTCAAGAACTACAAAAAGGATACAAGCTTAAAGATAGAGTATTAAGACCATCAAT
GGTCAAAGTAAACCAATAACTTAAATTTGGCGAAAAGACATTGTTTAAAATTAAATTAAT
TTAATGATTAAATGGAGGAATTTTATTATGAGTAAAATTATTGGTATAGACTTAGGTACA
ACAAATTCATGTGTAACAGTATTAGAAGGCGATGAGCCAAAAGTAATTCAAAACCCTGAA
GGTTCACGTACAACACCATCTGTTGTAGCTTTCAAAAATGGAGAAACTCAAGTTGGTGAA
GTAGCAAAACGTCAAGCTATTACAAACCCAAACACTGTTCAATCTATTAAACGTCATATG
GGTACTGATTATAAAGTAGATATTGAAGGTAAATCATACACACCACAAGAAATCTCAGCT
ATGATTTTACAAAACTTAAAAAATACAGCTGAAAGCTATTTAGGTGAGAAAGTTGACAAA
GCTGTAATTACAGTACCTGCATACTTTAACGATGCTGAACGTCAAGCAACTAAAGATGCT
GGTAAAATTGCTGGTTTAGAAGTTGAGCGTATCATTAATGAACCAACAGCTGCAGCATTA
GCATATGGTTTAGACAAAACTGATAAAGATGAAAAAGTTCTTGTTTTTTGACTTAGGTGGC
GGTACATTTGACGTATCTATCCTAGAATTAGGTGACGGTGTATTCGAAGTACTATCAACA
GCCGGTGACAACAAACTTGGCGGTGATGATTTTGACCAAGTAATTATTGACTACCTAGTT
GCAGAATTCAAAAAAGAAAATGGCGTAGACTTATCTCAAGATAAAATGGCATTACAACGT
TTGAAAGATGCTGCTGAAAAAGCTAAAAAAGACTTATCAGGTGTATCACAAACTCAAATC
TCATTACCATTTATCTCAGCTGGTGAAAACGGTCCATTACACTTAGAAGTAAACTTAACT

CGTTCTAAATTTGAAGAATTATCAGATTCATTAATTAGAAGAACAATGGAACCTACACGC
CAAGCAATGAAAGACGCTGGCTTAACAAACTCAGATATCGATGAAGTTATCTTAGTTGGT
GGATC
LOCUS 9A (D22)
GATCAGAATACGATTAAGCAAGGTGTTAACTTCACTGATGCCGACGAAGCGAAACGTAAT
GCATATACAAATGCAGTGACGCAAGCTGAACAAATTTTAAATAAAGCACAAGGTCCAAAT
ACTTCAAAAGACGGTGTCGAAACTGCGTTAGAAAATGTACAACGTGCTAAAAACGAATTG
AACGGTAATCAAAATGTTGCGAACGCTAAGACAACTGCGAAAAATGCATTGAATAACCTA
ACATCAATTAATAATGCACAAAAAGAAGCATTGAAATCACAAATTGAAGGTGCGACAACA
GTTGCAGGTGTAAATCAAGTGTCTACAACGGCATCTGAATTAAATACAGCAATGAGCAAC
TTACAAAATGGTATTAATGATGAAGCAGCTACAAAAGCAGCGCTTAATGGTACTCAAAAC
CTTGAAAAAGCTAAACAACACGCAAATACAGCAATTGACGGTTTAAGCCATTTAACAAAT
GCACAAAAAGAGGCATTAAAACAATTGGTACAACAATCGACTACTGTTGCAGAAGCACAA
GGTAATGAGCAAAAAGCAAACAATGTTGATGCAGCAATGGACAAATTACGTCAAAGTATT
GCAGATAATGCGACAACAAAACAAAACCAAAATTATACTGATGCAAGTCAGAATAAAAAG
GATGCGTACAATAATGCTGTCACAACTGCACAAGGTATTATTGATCAAACTACAAGTCCA
ACTTTAGATCCGACTGTTATCAATCAAGCTGCTGGACAAGTAAGCACAACTAAAAATGCA
TTAAATGGTAATGAAAACCTAGAGGCAGCGAAACAACAAGCGTCACAATCATTAGGTTCA
TTAGATAACTTAAATAATGCGCAAAAACAAACAGTTACTGATCAAATTAATGGCGCGCAT
ACTGTTGATGAAGCAAATCAAATTAAGCAAAATGCGCAAAACTTAAATACAGCGATGGGT
AACTTGAAACAAGCGATAGCTGACAAAGATGCTACGAAAGCGACAGTTAACTTCACTGAT
GCAGATCAAGCAAAACAACAAGCATATAACACTGCTGTTACAAATGCTGAAAATATCATT
TCAAAAGCTAATGGCGGCAATGCAACACAAGCTGAAGTTGAACAAGCAATCAAACAAGTT
AATGCTGCAAAACAAGCATTAAATGGTAATGCCAACGTTCAACATGCAAAAGACGAAGCA
ACAGCATTAATTAATAGCTCTAATGACCTTAACCAAGCACAAAAAGACGCATTAAAACAA
CAAGTTCAAAATGCAACTACTGTAGCTGGTGTAAACAATGTTAAACAAACAGCACAAGAG
TTAAACAATGCTATGACACAATTAAAACAAGGCATTGCAGATAAAGAACAAACAAAAGCT
GATGGTAACTTTGTCAATGCAGATCCTGATAAGCAAAATGCATATAATCAAGCAGTAGCG
AAAGCTGAAGCATTAATTAGTGCTACGCCTGATGTTGTCGTTACACCTAGCGAAATTACT
GCAGCGTTAAATAAAGTTACGCAAGCTAAAAATGATTTAAATGGTAATACAAACTTAGCA
ACGGCGAAACAAAATGTTCAACATGCTATTGATCAATTGCCAAACTTAAACCAAGCGCAA
CGTGATGAATACAGCAAACAAATCACGCAAGCAACACTTGTACCAAACGTCAATGCTATT
CAACAAGCGGCGACAACGCTTAATGACGCGATGACACAATTGAAACAAGGTATTGCGAAT
AAAGCACAAATTAAAGGTAGCGAGAACTATCACGATGCTGATACTGACAAGCAAACAGCA
TATGATAATGCAGTAACAAAAGCAGAAGAATTGTTAAAACAAACAACAAATCCAACAATG
GATCCAAATACAATTCAACAAGCATTAACTAAAGTGAATGACACAAATCAAGCACTTAAC
GGTAATCAAAAATTAGCTGATGCCAAACAAGATGCTAAGACAACACTTGGTACACTAGAT
CATTTAAATGATGCTCAAAAACAAGCGCTAACAACTCAAGTTGAACAAGCACCAGATATT
GCAACAGTTAATAATGTTAAGCAAAATGCTCAAAATCTGAATAATGCTATGACTAACTTA
AACAATGCATTACAAGATAAAACTGAGACATTAAATAGCATTAACTTTACTGATGCAGAT
CAAGCTAAGAAAGATGCTTATACTAATGCGGTTTCACATGCAGAAGGTATTTTATCTAAA
GCAAATGGCAGCAATGCAAGTCAAACTGAAGTGGAACAAGCGATGCAACGTGTGAACGAA
GCGAAACAAGCATTGAATGGTAATGACAATGTACAACGTGCAAAAGATGCAGCGAAACAA
GTGATTACAAATGCAAATGATTTAAATCAAGCAATGACACAATTGAAACAAGGTATTGCA
GATAAAGACCAAACTAAAGCAAATGGTAACTTTGTCAATGCTGATACTGATAAGCAAAAT
GCTTACAACAATGCGGTAGCACATGCTGAACAAATAATTAGTGGTACACCAAATGCAAAC
GTGGATCCACAACAAGTGGCTCAAGCGTTACAACAAGTGAATCAAGCTAAGGGTGATTTA
AACGGTAACCATAACTTACAAGTTGCTAAAGACAATGCAAATACAGCCATTGATCAGTTA
CCAAACTTAAATCAACCACAAAAAACAGCATTAAAAGACCAAGTGTCGCATGCAGAACTT
GTTACAGGTGTTAATGCTATTAAGCAAAATGCTGATGCGTTAAATAATGCAATGGGTACA
TTGAAACAACAAATTCAAGCGAACAGTCAAGTACCACAGTCAGTTGACTTTACACAAGCG

GATCAAGACAAACAACAAGCATATAACAATGCGGCTAACCAAGCGCAACAAATCGCAAAT
GGCATACCAACACCTGTATTGACGCCTGATACAGTAACACAAGCAGTGACAACTATGAAT
CAAGCGAAAGATGCATTAAACGGTGATGAAAAATTAGCACAAGCGAAACAAGAAGCTTTA
GCAAATCTTGATACGTTACGCGATTTAAATCAACCACAACGTGATGCATTACGTAACCAA
ATCAATCAAGCACAAGCGTTAGCTACAGTTGAACAAACTAAACAAAATGCACAAAATGTG
AATACAGCAATGAGTAACTTGAAACAAGGTATTGCAAACAAAGATACTGTCAAAGCAAGT
GAGAACTATCATGATGCTGATGCCGATAAGCAAACAGCATATACAAATGCAGTGTCTCAA
GCGGAAGGTATTATCAATCAAACGACAAATCCAACGCTTAACCCAGATGAAATAACACGT
GCATTAACTCAAGTGACTGATGCTAAAAATGGCTTAAACGGTGAAGCTAAATTGGCAACT
GAAAAGCAAAATGCTAAAGATGCCGTAAGTGGGATGACGCATTTAAACGATGCTCAAAAA
CAAGCATTAAAAGGTCAAATCGATCAATCGCCTGAAATTGCTACAGTGAACCAAGTTAAA
CAAACAGCAACGAGCCTAGATCAAGCAATGGATCAATTATCACAAGCTATTAATGATAAA
GCTCAAACATTAGCGGACGGTAATTACTTAAATGCAGATCCTGACAAACAAAATGCGTAT
AAACAGGCAGTAGCAAAAGCTGAAGCATTATTGAATAAACAAAGTGGTACTAATGAAGTA
CAAGCACAAGTTGAAAGCATCACTAATGAAGTGAACGCAGCGAAACAAGCATTAAATGGT
AATGACAATTTGGCAAATGCAAAACAACAAGCAAAACAACAATTGGCGAACTTAACACAC
TTAAATGATGCACAAAAACAATCATTTGAAAGTCAAATTACACAAGCGCCACTTGTTACA
GATGTCACTACGATTAATCAAAAAGCACAAACGTTAGATC

LOCUS 9B (I2)

GATCTTTTAGTTTATTTATAGTTCTTGAAAAGCGTGCTACAAATCCTTTAATCGATTTTA
AATTATTTAAAAATAAAGCTTACACAGGTGCAACAGCTTCAAACTTTTTGTTAAATGGTG
TTGCAGGAACATTAATAGTAGCCAACACATTTGTTCAAAGAGGTTTAGGATATTCTTCAT
TGCAAGCAGGAAGTTTATCAATCACTTATTTAGTAATGGTACTAATTATGATTCGTGTTG
GTGAAAAGTTACTTCAAACACTCGGATGCAAGAAACCAATGTTAATTGGAACAGGAGTTC
TTATTGTCGGAGAATGTCTCATTTCATTAACTTTCTTGCCAGAAATATTCTATGTCATTT
GTTGTATTATAGGTTATTTATTCTTTGGTTTAGGACTAGGGATATATGCTACACCATCAA
CAGATACAGCAATTGCAAATGCACCGTTAGAAAAAGTAGGCGTTGCTGCAGGTATCTATA
AAATGGCTTCTGCATTAGGTGGAGCATTTGGCGTCGCATTGAGTGGTGCAGTATATGCAA
TCGTATCAAATATGACAAACATTTATACAGGTGCAATGATTGCATTATGGTTAAATGCAG
GTATGGGAATATTATCATTCGTTATCATTTTGTTACTTGTGCCTAAACAAAACGACACTC
AATTATGATAATTGAGAATTAAATTGAAATCATACAAGTCGCTACAATATTAAACAAAAA
TATAAACCGATTCTTATGTGTCATTATTTTAAATGAACATAGGGATTGGTTTTTTATTAC
TCTTTTACGCTACTTTATTTATAATTATTATAAATTGTCACAAATTCAATTTACCTTACA
ATATATTTTGTGTTATTATATTCTGGAGCATAAATAAATTGTTCAACACATAGTTGTAAT
GTGTTTCAATACTTTTTGGATAGATTGCGAAATTGTATTGAATCGTCATCGTTTTAAATT
TTTAAATGAGAATGGAATGAGCATTACAATACACAAGCAATCAAAAGTAAATACATTCAC
AACACAACAGAGACATAACAACAAGATAAGGAGTGAACAATAGCTGTGAATTATCGTGAT
AAAATTCAAAAGTTTAGTATTCGTAAATATACAGTTGGTACATTTTCAACTGTCATTGCG
ACATTGGTATTTTTAGGATTCAATACATCACAAGCACATGCTGCTGAAACAAATCAACCA
GCAAGCGTGGTTAAACAGAAACAACAAAGTAATAATGAACAGACTGAGAATCGAGAATCT
CAAGTACAAAATTCTCAAAATTCACAAAATGGTCAATCATTATCTGCTACTCATGAAAAT
GAGCAACCAAATATTAGTCAAGCTAATTTAGTAGATCAAAAAGTAGCGCAATCATCTACT
ACTAATGATGAACAACCAGCATCTCAAAATGTAAATACAAAGAAAGATTCGGCAACGGCT
GCGACAACACAACCAGATAAAGAACAAAGTAAGCATAAACAAAACGAAAGTCAATCTGCT
AATAAAAATGGAAACGACAATAGAGCGGCTCATGTAGAAAATCATGAAGCAAATGTAGTA
ACAGCTTCAGATTCATCTGATAATGGTAACGTACAACATGACCGAAATGAATTACAAGCG
TTTTTTGATGCAAATTATCATGATTATCGCTTTATTGACCGTGAAAATGCAGATTCTGGC
ACATTTAACTATGTAAAAGGCATTTTTGATAAGATTAATACGTTATTAGGCAGTAATGAT
C

LOCUS 9C (J13)
GATCAAGAAAAACGTCAAGCGTATGATTCAAAAGTGACTAACGCTGAAAATATCATTAGT
GGTACACCGAATGCGACATTAACAGTCAATGACGTAAATAGTGCGGCATCACAAGTCAAT
GCGGCTAAAACAGCATTAAATGGTGATAACAACTTACGTGTAGCGAAAGAGCATGCCAAC
AATACAATTGACGGCTTAGCACAATTGAATAATGCACAAAAAGCAAAATTAAAAGAACAA
GTTCAAAGTGCAACTACATTAGATGGTGTTCAAACTGTTAAAAATAGTTCTCAAACGTTG
AATACAGCGATGAAAGGCTTAAGAGATAGTATTGCGAATGAAGCAACAATTAAAGCAGGT
CAAAACTACACTGACGCAAGTCCAAATAATCGTAACGAGTACGACAGTGCAGTTACTGCA
GCAAAAGCAATCATTAATCAAACATCGAACCCAACGATGGAACCAAATACTATTACGCAA
GTAACATCACAAGTGACAACTAAAGAACAGGCATTAAATGGTGCGCGAAACTTAGCTCAA
GCTAAGACAACTGCGAAAAACAACTTGAATAACTTAACATCAATTAACAATGCACAAAAA
GATGCGTTAACGCGTAGCATTGATGGTGCAACAACAGTAGCTGGTGTAAATCAAGAAACT
GCAAAAGCAACAGAATTAAATAACGCAATGCATAGTTTACAAAATGGTATCAATGATGAG
ACACAAACAAAACAAACTCAGAAATACCTAGATGCAGAGCCAAGTAAGAAATCAGCTTAT
GATCAAGCAGTAAATGCAGCGAAAGCAATTTTAACAAAAGCTAGTGGTCAAAATGTAGAC
AAAGCAGCAGTTGAACAAGCATTGCAAAATGTGAACAGTACGAAGACGGCGTTGAACGGT
GATGCGAAATTAAATGAAGCTAAAGCAGCTGCGAAACAAACGTTAGGTACATTAACACAC
ATTAATAATGCACAACGTACAGCGTTAGACAATGAAATTACACAAGCAACAAATGTTGAA
GGTGTTAATACAGTTAAAGCCAAAGCGCAACAATTAGATGGTGCTATGGGTCAATTAGAA
ACATCAATTCGTGATAAAGACACGACGTTACAAAGTCAAAATTATCAAGATGCTGATGAT
GCTAAACGAACTGCTTATTCTCAAGCAGTAAATGCAGCAGCAACTATTTTAAATAAAACA
GCTGGCGGTAATACACCTAAAGCAGATGTTGAAAGAGCAATGCAAGCTGTTACACAAGCA
AATACTGCATTAAACGGTATTCAAAACTTAGATCGTGCGAAACAGGCTGCTAACACAGCG
ATTACAAATGCTTCGGACTTAAATACAAAACAAAAAGAAGCATTAAAAGCACAAGTAACA
AGTGCAGGACGTGTATCTGCAGCAAATGGTGTTGAACATACTGCGACTGAATTAAATACT
GCGATGACAGCTTTAAAGCGTGCCATTGCTGATAAAGCTGAGACAAAAGCTAGTGGTAAC
TATGTCAATGCTGATGCGAATAAACGTCAAGCATATGATGAAAAAGTTACAGCTGCCGAA
AATATCGTTAGTGGTACACCAACACCAACGTTAACACCAGCAGATGTTACAAATGCAGCA
ACGCAAGTAACGAATGCTAAGACGCAGTTAAACGGTAATCATAATTTAGAAGTAGCGAAA
CAAAATGCTAACACTGCAATTGATGGTTTAACTTCTTTAAATGGTCCGCAAAAAGCAAAA
CTTAAAGAACAAGTGGGTCAAGCGACGACGTTGCCAAATGTTCAAACTGTTCGTGATAAT
GCACAAACATTAAACACTGCAATGAAAGGTCTACGAGATAGCATTGCGAATGAAGCAACG
ATTAAAGCAGGTCAAAACTACACAGATGCAAGTCAAAACAAACAAACTGACTACAACAGT
GCAGTCACTGCAGCAAAAGCAATCATTGGTCAAACAACTAGTCCATCAATGAATGCGCAA
GAAATTAATCAAGCGAAAGACCAAGTGACAGCTAAACAACAAGCGTTAAACGGTCAAGAA
AACTTAAGAACTGCGCAAACAAATGCGAAGCAACATTTGAACGGCTTAAGTGACTTAACT
GACGCTCAAAAAGATGCAGTGAAACGTCAAATCGAAGGTGCAACGCATGTTAATGAAGTA
ACACAAGCACAAAATAATGCGGATGCATTAAATACAGCTATGACGAACTTGAAAAATGGT
ATTCAAGATCAGAATACGATTAAGCAAGGTGTTAACTTCACTGATGCCGACGAAG
LOCUS 9D (M11)
TATCACAAGCTATTAATGATAAAGCTCAAACATTAGCGGACGGTAATTACTTAAATGCAG
ATCCTGACAAACAAAATGCGTATAAACAGGCAGTAGCAAAAGCTGAAGCATTATTGAATA
AACAAAGTGGTACTAATGAAGTACAAGCACAAGTTGAAAGCATCACTAATGAAGTGAACG
CAGCGAAACAAGCATTAAATGGTAATGACAATTTGGCAAATGCAAAACAACAAGCAAAAC
AACAATTGGCGAACTTAACACACTTAAATGATGCACAAAAACAATCATTTGAAAGTCAAA
TTACACAAGCGCCACTTGTTACAGATGTCACTACGATTAATCAAAAAGCACAAACGTTAG
ATCATGCGATGGAATTATTAAGAAATAGTGTTGCGGATAATCAAACGACATTAGCGTCTG
AAGATTATCATGATGCAACTGCGCAAAGACAAAATGACTATAACCAAGCTGTAACAGCTG

CTAATAATATAATTAATCAAACTACATCGCCTACGATGAATCCAGATGATGTTAATGGTG
CAACGACACAAGTGAATAATACGAAAGTTGCATTAGATGGTGATGAAAACCTTGCAGCAG
CTAAACAACAAGCAAACAACAGACTTGATCAATTAGATCATTTGAATAATGCGCAAAAGC
AACAGTTACAATCACAAATTACGCAATCATCTGATATTGCTGCAGTTAATGGTCACAAAC
AAACAGCAGAATCTTTAAATACTGCGATGGGTAACTTAATTAATGCGATTGCAGATCATC
AAGCCGTTGAACAACGTGGTAACTTCATCAATGCTGATACTGATAAACAAACTGCTTATA
ATACAGCGGTAAATGAAGCAGCAGCAATGATTAACAAACAAACTGGTCAAAATGCGAACC
AAACAGAAGTAGAACAAGCTATTACTAAAGTTCAAACAACACTTCAAGCGTTAAATGGAG
ACCATAATTTACAAGTTGCTAAAACAAATGCGACGCAAGCAATTGATGCTTTAACAAGCT
TAAATGATCCTCAAAAAACAGCATTAAAAGACCAAGTTACAGCTGCAACTTTAGTAACTG
CAGTTCATCAAATTGAACAAAATGCGAATACGCTTAACCAAGCAATGCATGGTTTAAGAC
AGAGCATTCAAGATAACGCAGCAACTAAAGCAAATAGCAAATATATCAACGAAGATCAAC
CAGAGCAACAAAACTATGATCAAGCTGTTCAAGCCGCAAATAATATTATCAATGAACAAA
CTGCAACATTAGATAATAATGCGATTAATCAAGCAGCGACAACTGTGAATACAACGAAAG
CAGCATTACATGGTGATGTGAAGTTACAAAATGATAAAGATCATGCTAAGCAAACGGTTA
GTCAATTAGCACATCTAAACAATGCACAAAAACATATGGAAGATACGTTAATTGATAGTG
AAACAACTAGAACAGCAGTTAAGCAAGATTTGACTGAAGCACAAGCATTAGATCAACTTA
TGGATGCATTACAACAAAGTATTGCTGACAAAGATGCAACACGTGCGAGCAGTGCATATG
TCAATGCAGAACCGAATAAAAAACAATCCTATGATGAAGCAGTTCAAAATGCTGAGTCTA
TCATTGCAGGATTAAATAATCCAACTATCAATAAAGGTAATGTATCAAGTGCGACTCAAG
CAGTAATATCATCTAAAAATGCATTAGATGGTGTTGAACGATTAGCTCAAGATAAGCAAA
CTGCTGGAAATTCTCTAAATCATTTAGATCAATTAACACCAGCTCAACAACAAGCGCTAG
AAAATCAAATTAATAATGCAACAACTCGTGATAAAGTGGCTGAAATCATTGCACAAGCGC
AAGCATTAAATGAAGCGATGAAAGCATTAAAAGAAAGTATTAAGGATCAACCACAAACTG
AAGCAAGTAGTAAATTTATTAACGAGGATCAAGCGCAAAAAGATGCTTATACGCAAGCAG
TACAACACGCGAAAGATTTGATTAACAAAACAACTGATCCTACATTAGCTAAATCAATCA
TTGATCAAGCGACACAGGCAGTGACAGATGCTAAAAACAATTTACATGGTGATCAAAAAC
TAGCTCAAGATAAGCAACGTGCAACAGAAACGTTAAATAACTTGTCTAACTTGAATACAC
CACAACGTCAAGCACTTGAAAATCAAATTAATAATGCAGCAACTCGTGGCGAAGTAGCAC
AAAAATTAACTGAAGCACAAGCACTTAACCAAGCAATGGAAGCTTTACGTAATAGCATTC
AAGATCAACAGCAAACGGAAGCGGGTAGCAAGTTTATCAATGAAGATAAACCACAAAAAG
ATGCTTACCAAGCAGCAGTTCAAAATGCAAAAGATTTAATTAATCAAACTAACAATCCAA
CGCTTGATAAAGCACAAGTTGAACAATTGACACAAGCTGTTAACCAAGCTAAAGATAACC
TACACGGTGATCAAAAACTTGCAGACGATAAACAACATGCGGTTACTGATTTAAATCAAT
TAAATGGTTTGAATAATCCGCAACGTCAAGCACTTGAAAGCCAAATAAACAACGCAGCAA
CTCGTGGCGAAGTAGCACAAAAATTAGCTGAAGCAAAAGCGCTTGATCAAGCAATGCAAG
CATTACGTAATAGTATTCAAGATCAACAACAAACAGAATCTGGTAGCAAGTTTATCAATG
AAGATAAACCGCAAAAAGATGCTTACCAAGCAGCAGTTCAAAATGCAAAAGATTTAATTA
ACCAAACAGGTAATCCAACACTCGACAAATCACAAGTAGAACAATTGACACAAGCAGTAA
CAACTGCAAAAGATAATCTACATGGTGATCAAAAACTTGCTCGTGATCAACAACAAGCAG
TAACAACTGTAAATGCATTGCCAAACTTAAATCATGCACAACAACAAGCATTAACTGATG
CTATAAATGCAGCGCCTACAAGAACAGAGGTTGCACAACATGTTCAAACTGCTACTGAAC
TTGATCACGCGATGGAAACATTGAAAAATAAAGTTGATCAAGTGAATACAGATAAGGCTC
AACCAAATTACACTGAAGCGTCAACTGATAAAAAAGAAGCAGTAGATCAAGCGTTACAAG
CTGCAGAAAGCATTACAGATCCAACTAATGGTTCAAATGCGAATAAAGACGCTGTAGACC
AAGTATTAACTAAGCTTCAAGAAAAAGAAAATGAGTTAAATGGTAATGAGAGAGTCGCTG
AAGCTAAAACACAAGCGAAACAAACTATTGACCAATTAACACATTTAAATGCTGATCAAA
TTGCAACTGCTAAACAAAACATTGATC
LOCUS 9E (M13)
GATCGTGTATTAGCCTCACATCCAGATGTTGCGACAATACGTCAAAACGTGACAGCAGCG
AATGCCGCTAAATCAGCACTTGATCAAGCACGTAATGGCTTAACAGTCGATAAAGCGCCT

TTAGAAAATGCGAAAAATCAACTACAACATAGTATTGACACGCAAACAAGTACAACTGGT
ATGACACAAGACTCTATAAATGCATACAATGCGAAGTTAACAGCTGCACGTAATAAGATT
CAACAAATCAATCAAGTATTAGCAGGTTCACCGACTGTAGAACAAATTAATACAAATACG
TCTACAGCAAATCAAGCTAAATCTGATTTAGATCATGCACGTCAAGCTTTAACACCAGAT
AAAGCGCCGCTTCAAACTGCGAAAACGCAATTAGAACAAAGCATTAATCAACCAACGGAT
ACAACAGGTATGACGACCGCTTCGTTAAATGCGTACAACCAAAAATTACAAGCAGCGCGT
CAAAAGTTAACTGAAATTAATCAAGTGTTGAATGGCAACCCAACTGTCCAAAATATCAAT
GATAAAGTGACAGAGGCAAACCAAGCTAAGGATCAATTAAATACAGCACGTCAAGGTTTA
ACATTAGATAGACAGCCAGCGTTAACAACATTACATGGTGCATCTAACTTAAACCAAGCA
CAACAAAATAATTTCACGCAACAAATTAATGCTGCTCAAAATCATGCTGCGCTTGAAACA
ATTAAGTCTAACATTACGGCTTTAAATACTGCGATGACGAAATTAAAAGACAGTGTTGCG
GATAATAATACAATTAAATCAGATCAAAATTACACTGACGCAACACCAGCTAATAAACAA
GCGTATGATAATGCAGTTAATGCGGCTAAAGGTGTCATTGGAGAAACGACTAATCCAACG
ATGGATGTTAACACAGTGAACCAAAAAGCAGCATCTGTTAAATCGACGAAAGATGCTTTA
GATGGTCAACAAAACTTACAACGTGCGAAAACAGAAGCAACAAATGCGATTACGCATGCA
AGTGATTTAAACCAAGCACAAAAGAATGCATTAACACAACAAGTGAATAGTGCACAAAAC
GTGCAAGCAGTAAATGATATTAAACAAACGACTCAAAGCTTAAATACTGCTATGACAGGT
TTAAAACGTGGCGTTGCTAATCATAACCAAGTCGTACAAAGTGATAATTATGTCAACGCA
GATACTAATAAGAAAAATGATTACAACAATGCATACAACCATGCGAATGACATTATTAAT
GGTAATGCACAACATCCAGTTATAACACCAAGTGATGTTAACAATGCTTTATCAAATGTC
ACAAGTAAAGAACATGCATTGAATGGTGAAGCTAAGTTAAATGCTGCGAAACAAGAAGCG
AATACTGCATTAGGTCATTTAAACAATTTAAATAATGCACAACGTCAAAACTTACAATCG
CAAATTAATGGTGCGCATCAAATTGATGCAGTTAATACAATTAAGCAAAATGCAACAAAC
TTGAATAGTGCAATGGGTAACTTAAGACAAGCTGTTGCAGATAAAGATCAAGTGAAACGT
ACAGAAGATTATGCGGATGCAGATACAGCTAAACAAAATGCATATAACAGTGCAGTTTCA
AGTGCCGAAACAATCATTAATCAAACAACAAATCCAACGATGTCTGTTGATGATGTTAAT
CGTGCAACTTCAGCTGTTACTTCTAATAAAAATGCATTAAATGGTTATGAAAAATTAGCA
CAATCTAAAACAGATGCTGCAAGAGCAATTGATGCATTACCACATTTAAATAATGCACAA
AAAGCAGATGTTAAATCTAAAATTAATGCTGCATCAAATATTGCTGGCGTAAATACTGTT
AAACAACAAGGTACAGATTTAAATACAGCGATGGGTAACTTGCAAGGTGCAATCAATGAT
GAACAAACGACGCTTAATAGTCAAAACTATCAAGATGCGACACCTAGTAAGAAAACAGCA
TACACAAATGCGGTACAAGCTGCGAAAGATATTTTAAATAAATCAAATGGTCAAAATAAA
ACGAAAGATCAAGTTACTGAAGCGATGAATCAAGTGAATTCTGCTAAAAATAACTTAGAT
GGTACGCGTTTATTAGATC
LOCUS 10 (D9)
GATCGTCGGCTAAAACTTGATGTGTTACATCTAAACCAAACACATTTATAGTAATCCCAC
TTTCAAAAACACGCTTCGCTGCTTCAGCATCTACCCAAATATTGAATTCTGCTGTAGGCG
TCCAATTTCCAAATGTACCACCACCCATCAAAGTAATAGATTCAATATGCTCAGCGATTC
TTGGCTCACGAATCAATGCCGTTGCTACATTCGTAAGAGGACCTGTCGCTACAATTGTTA
CAGGTGTATCACTCGTCATCACTTTGTTTATAATCACATCTGATGCTGGCATTGCAACTG
CTTGACGTGATGGTGTCGACGGTAGTTTCGGACCATCTAATCCAGATTCCCCATGTATTT
CAGAAGCAAAGGCAGCTGGTTTAATTAACGGCCTATCCGCACCTTTCGCTACTGCTATAT
CTTGGCGTCCCATAATATCCAATACGTTCAAGGCGTTTGTCGTATTCTTGTCAACTGATT
GATTACCTGCGACTGTTGTTACAGCTAATATCTCTAGTGGACTGTCAATTGCCCCCGCTA
AAATTAATGCTATTGCATCATCGTGTCCTGGATCACAATCCATAATAATCTTTCTTTTCA
TTTATATATCCACCTTTCTTAAGTTGTTATCGATAGCTTATGTATATTTATTTATGTGGT
GAATCATGTTTATTTTGAAAAATAGTTTTAACTTTCTCATATTTTTGGATACAAACACTA
TTTATCTATTTTATGGCTTATAAATTTATCCGATATGCCTTATCAACCTACCTCGCTAAA
AATAGGATGTCTACATATCTATACCGACTTTTGTCAACTCATTTTCACAACAATATAAAC
AGCAATTTATATGATTGTTACATGATTCAAACAATTTTTATGAAAAATATTTTCATACAC
AGAATATATATTGATATTAAATTTCTCAAAAGCTATATTGAGAATAATTAGGAGGGATGT
TGATGAAATCTTTATTTGAAAAAGCACAGCAGTTCGGCAAGTCCTTTATGTTACCTATCG

CAATCTTACCAGCTGCAGGTCTATTGTTGGGTATCGGTGGTGCATTAAGTAATCCAAACA
CCGTTAAAGCATACCCTATTTTAGATATTACCTTATTACAAAATATTTTTACATTAATGT
CAGCTGCAGGTAGTATTGTTTTCCAAAATTTACCGGTCATCTTTGCAATTGGTGTCGCAA
TCGGATTATCTAGAAGCGATAAAGGTACTGCAGGTTTAGCTGCGCTGCTCGGTTTCTTAA
TTATGAACGCAACTATGAATGGCTTATTAACTATCACGGGCACATTGGCAAAAGATC
LOCUS 11 (D10)
GATCGTCGGCTAAAACTTGATGTGTTACATCTAAACCAAACACATTTATAGTAATCCCAC
TTTCAAAAACACGCTTCGCTGCTTCAGCATCTACCCAAATATTGAATTCTGCTGTAGGCG
TCCAATTTCCAAATGTACCACCACCCATCAAAGTAATAGATTCAATATGCTCAGCGATTC
TTGGCTCACGAATCAATGCCGTTGCTACATTCGTAAGAGGACCTGTCGCTACAATTGTTA
CAGGTGTATCACTCGTCATCACTTTGTTTATAATCACATCTGATGCTGGCATTGCAACTG
CTTGACGTGATGGTGTCGACGGTAGTTTCGGACCATCTAATCCAGATTCCCCATGTATTT
CAGAAGCAAAGGCAGCTGGTTTAATTAACGGCCTATCCGCACCTTTCGCTACTGCTATAT
CTTGGCGTCCCATAATATCCAATACGTTCAAGGCGTTTGTCGTATTCTTGTCAACTGATT
GATTACCTGCGACTGTTGTTACAGCTAATATCTCTAGTGGACTGTCAATTGCCCCCGCTA
AAATTAATGCTATTGCATCATCGTGTCCTGGATCACAATCCATAATAATCTTTCTTTTCA
TTTATATATCCACCTTTCTTAAGTTGTTATCGATAGCTTATGTATATTTATTTATGTGGT
GAATCATGTTTATTTTGAAAAATAGTTTTAACTTTCTCATATTTTTGGATACAAACACTA
TTTATCTATTTTATGGCTTATAAATTTATCCGATATGCCTTATCAACCTACCTCGCTAAA
AATAGGATGTCTACATATCTATACCGACTTTTGTCAACTCATTTTCACAACAATATAAAC
AGCAATTTATATGATTGTTACATGATTCAAACAATTTTTATGAAAAATATTTTCATACAC
AGAATATATATTGATATTAAATTTCTCAAAAGCTATATTGAGAATAATTAGGAGGGATGT
TGATGAAATCTTTATTTGAAAAAGCACAGCAGTTCGGCAAGTCCTTTATGTTACCTATCG
CAATCTTACCAGCTGCAGGTCTATTGTTGGGTATCGGTGGTGCATTAAGTAATCCAAACA
CCGTTAAAGCATACCCTATTTTAGATATTACCTTATTACAAAATATTTTTACATTAATGT
CAGCTGCAGGTAGTATTGTTTTCCAAAATTTACCGGTCATCTTTGCAATTGGTGTCGCAA
TCGGATTATCTAGAAGCGATAAAGGTACTGCAGGTTTAGCTGCGCTGCTCGGTTTCTTAA
TTATGAACGCAACTATGAATGGCTTATTAACTATCACGGGCACATTGGCAAAAGATC
LOCUS 12 ()
ATACACAACGGCTGGTTTATGTTTAGCATCGATTGTTTTACTGTCATCGTAAAATGCAGC
TAACATCGCTTCATCTTCATTGTCATGTAATGATTTGTGCAAATGAATTTTTTGCATCAT
TAATTGATAATCTTTAGGAATAACTTTAACGACGACATCTTCAATGCGATCAAAATGTTT
TAACACATGAATCGCTCTCGTACTATTCGTGTGTGACACATGTTCTTCCAGCATTTGCTT
AATGAATGCTTTTTCTTCTTGGTGTTTAATCTTTGTAAACGAAAGCGTATCTAGTTGATT
ATTTTCAACAAAAGCTTCTACATCAGACGGGATAACGTAAGCAATACCACCACTCATACC
TTGACCGAAGTTCTTACCTACATCACCTAAATTAATGACATGTCCACCAGTCATATACTC
TAATCCATGGTCGCCGATACCTTCAACGACAACATCTACACCACTATTTCTAATACAGAA
TCTTTCTCCTGCACTACCGTTAATAAATGCCTTACCACTTGTCGCACCATAGAATGAGAC
GTTACCAGCAATAATTTCATTTTGTCGTTCTTCAAAAGGTGCTTTGACAATGACCGTACC
ACCAGATAATCCTTTACCAACATAGTCATTCGCATCTCCAGTATGATGAATCATTAAGCC
TTTCGGTGCATATGCTGCAAGACTTTGACCAGCATGACCATTCGTATAAACATTAATTGT
ATTTTCAGGAAGTCCTGCTTCTCCATATTGTTTCGAAATCTCACTACCTGTAATAACCCC
TACATCACGTTGTTCATTATTTACTGTAAAGCTACCTGTATAGCGACGCCCTTCAGCAAT
ATATGGCTTCGTTACTTCATATAAATTTGTTAAATCAAATCCATGCTCAAGATTATGATT
TTGTTGAATTTCTTTTGTGTTTGGCCCATCGAAAGGACATAACAGTTTTTCAACATCAAT
ACTAGCCGCTTTGCTATTCGCTTTTAATGTTGATGATCGTTGTAATAAATCAGTTCTTCC
AACTAAGTCTTCTACACGTTTCAAACCTAAAGATGCTAAAATTTCTCTTAATTCTTGTGC
AATAAAATGCATAAAATTAACAACATGATGTGCTTTACCTCTATATAAAGCACGTAAATC

TTTGTTTTGAGTTGCAACTCCTACTGGACATGTATCTTTATGGCATACACGCATCATAAT
ACAGCCCAACACCACTAATGGTGCAGTTGCAAATCCAAATTCTTCCGCTCCAAGCGCACA
TGCGTACGCTACATCTTTACCAGTTAATAACTTACCGTCTGTTTCTAACTTAACACGACT
TCTTAAGTCATTTAGTTTTAATGTTTGATGTGTTTCTGCTAAACCAATCTCCCAAGGAAC
ACCGGCATGCTGAATACTCGTTTTGGGTGAAGCCCCTGTACCACCATCGTAACCACTGAT
GACAATTTTATCTGCAAATGCTTTTGCCACCCCAGATGCAATGGTACCAACACCTGTTTT
CGAAACTAATTTTACCGCGATATCTGCATCTTTATTCGCATTTTTCAAATCATGTATCAG
TTGCGCTAAATCTTCTATTGAATAAATATCATGATGTGGCGGTGGTGAAATCAGACCGAT
ACCTGGCGTTGACCCTCTTGTCTTCGCAATCCACGGATATACCTTAGTACCAGGTAATTG
ACCACCTTCACCAGGCTTTGCACCTTGCGCAACTTTAATTTGAATTTCTTTGGCATGTTG
TAAATAATCACTAGTTACACCAAAACGCCCAGAAGCAACTTGTTTAATCGCACTTACTTT
GTTGCTTCCATCAACTTGTACTTCATAACGTTTTGCATCTTCGCCACCTTCACCACTATT
ACTCTTTCCACCTAATTGGTTCATGGCTTGTGCTAACGTTTCATGTGCTTCCGCTGAAAT
CGATCCATAACTCATCGCCCCTGTATTAAAGCGTTTGACAATGTCACTTACCGGTTCAAC
TTGGTCGATGTCAATCGGTGTACATGCTTTAAATTCAAGTAAATGTCTAATGTGATCTGT
TCTATTTTTGTTCACCGCTTCAGAGTATGCTTTAAATTGCGCATAGTCATTTTCTTTACA
TGCGTGCTGCAATAAGAAAATAGATTCCGGATTAAAAGCATGATGTTGACCTTGTTGTCT
CCATTGGAATGTACTACCTGATGCAAGATAATTATCATCACTTTGTTGACGTGCTTTATT
TTCAGCATCAATTTGATCAATCGAAATACCAGATAACTTAGACTGTGTCCCAGTAAAATA
ACGATCAATCACATCATGAGACAAGCCAATCGCTTCAAATATTTGTGCCCCTTGATAACT
TTGCACTGTCGAAATTCCCATCTTAGCCATTACTTTAATGACACCTTCTGACAATACATC
CGTATATGTCTTAACATTATCGACAACGGTGCCTTGTAACCCTTCTGTCAATGTCAGTTG
TTCAACTGTACGTTGCGCTAGGTATGGCACAATTGCATTCGCGCCATATGCGAGTAAACA
AGCAACATGATGCACTTCTCGTGTCTCACCAGATTTAGCGACTAAACTTGTAGACATACG
TAAATCTGCTTTAATAAGTAATTGATGCACATGACTTATTGCGAGTAACATCGGCATTGC
AAAGCCATTGCTATCAACTAATCCACTATCATCTAACACTAGAATTTGAGCGCCTTGCTT
TACAGCATTCACTGCTTCTCGGCCTAATGCTTCTAACGCATCTTCCAAATCCCCTTCATA
TACCGTTGATAAATAAGTTAATTTAAAATGTTCCTGATCAATCGCTGCTAAGTGTGATTC
ATTCAATACCGGCCTTTTCAATTGAATACGATCTAAAACCGTTTCGTCAGGTGCTAGTAA
GTTACCTTCGCCACCTAAATAAGAAAGTTCACTCGTTACGATTTTTTCACGATACGCATC
AATTGGTGGATTCGTAACTTGTGCAAACAGCTGTTTAAAGTAATTAAATAGTGATTCTGG
TCGCTCGTTCAACACTGCAATTGGCGCATCATATCCCATTGCACCGATAGGATCCTTCTT
ACCTTCTACAAGTTCCTGAATATACTTATGAATCTCTTCTTTCGTGTATGCAAACTGACG
TTGTAATTTAAATAACGTCTCATCTTTCCATTGCGAATCTTGATATTGTATATTTTCAAA
ATCAAAGTCAACTTTATGGTTATCAATCCACGCTTTATATGGTAATTCTCCAGCAATCGC
ACCTTTTAAATCATTATTTTCAATGACTTTATTCTGTTTAAAATCAACAAGCAATAACTT
TCCAGGATTCAATTGACCTTTAAAAGCAACATTACTTTCAGGTACGTCCACAACACCCAC
TTCAGATGAAAAGACAATAAAGTTATCTTTAGTAATCGTATAACGACCTGGACGTAATCC
ATTTCTATCTGTAAGCGCGCCAAGTTTGTCACCGTTACAGAACGAAATCATTGTAGGACC
ATCCCACGGTTCCATTAAATAACTATAAAATTCATAAAACGCACGTACATTTGCATCATT
CGCTTCATTATATAACCAAGGTTCAGGTATGAGTAACATCGCTGCCTTTTCTGGCTCCAT
GGCTAACGATAAGAACTCTAGCGCATTATCTACAATGGCAGAGTCACTACCATCCTCATC
GACAATTTGAAACACTTTATGTTGATCCTCGCCAAATAATGTTTCGATTAATTTATGTTG
GCGTGCTCGCATCCAGTTTACATTACCTTTAATCGTGTTAATCTCACCATTATGCATTAA
CATACGGTTAGGATGTGCCCTTTTCCAACTCGGGAATGTATTCGTACTAAATCTCGAATG
CACTAACCCTAGCTTTGATTGATATAAATCATCCGATAAATCTGTATATAGTTTTTTAAT
TTGGTCTGATCGTAACCAACCTTTATATACAATTGTTTTGCGTGATAAGCTCGTAAAATA
CAATTCTAAATCGCACTGAGTCGAATAGAACTCTAATTGTTTTCTCGCTAAAAACAAACG
CTTTTCAACATCTTCAATGTCCCTAATATCAATAAACACTTGTTGAATGACTGGCATCGT
ATCTGCTACATGTTTAGCAATGGCATCTTTATTAACTGGTACATTACGATAACCAAGAAT
TGATAACCCTTCGCCTTCAAAATATTTTTTAAAAACTACTTCATGTTCAGAACCTAAAAT
GCGTTCTTTGGAAAAAAATAACCCCACGGCATATTCACCTTCACCTGGGATATCAAAGTC
CGTTACATGTTGTTTGAAAAATGCAAAAGGTATTTCAGTCATAATACCTGCGCCATCACC
AGTGATGCCATCTGCGCCGACCCCGCCCCT

LOCUS 13 (D18)
GATCCATTGTTCGCAGCAGCTGATGTCATTTCATACATAACTTGTGAAATACCATGAAAA
GACGGATTCGTTATACTTTCACTTGCTCCAGGAATCATAAAAGCAAGTGCTGAAAATACT
AAAATTAAAATTGGGTGTATGAGAAAGACTAAGACAATACATTTCATTTCACGGGCGCCA
ATTGGCATATTTAAATATTCTGGTGTTTTACCAACCATCAAACTGCATATAAACACCGTC
AGTAAGACAAATATCAATAAATTCATGAGTCCTACGCCTTCGCCACCAAATACAACATTT
AGCATCATTAATACCATTGGTCCTAATCCACCTATAGGCGTTAAGCTATCATGCATGTTA
TTAACAGAACCCGTTGTAAATGCCGTCGTAATAACTGTAAATAGTGCTGACAAACCTGCT
CCAAACCGTACCTCTTTACCTTCCATATTCGGTCCATAAATGCCTAAATTCGCTAGTATT
GGATTACCACGATACTCACTCCACATAGTTAATGTAAGAATTGCTATAAAAATGAAAAAC
ATTGCGACAAATAATATCAACGCATGACGATGTACTCGTTTACCATGTCTACTTAACATG
CGACCAAATAAGAACAACATTGACATAGGAAGTAACATCATACTGCCCATTTCTATAAAA
TTGCTCCAAATATTTGGATTTTCAAAAGGTGTTGCAGAATTTCCTGCTAAAAATCCTCCA
CCATTCGTACCAAGATGTTTTATTGATTCAAGTGATGCAATAGGTCCAAATGCAATATGT
TGAATATGTCCGCTTAAAGTCCGAATCATTAAATTAGCATGCAACGTTTGTGGTACACCT
TGAGTCATCAATAAAATACTAATTAAACATGATAATGGTAAAAGTACTCGGACAATAAAC
CGAACAATATCTTGATAAAAATTACCAATGATATTAGTTAATCCAGTTAAACGTCTCAAC
ATCGCTATACAAACGGCGTAACCTGATGCACTAGATGTAAACATTAAATATGTCATTACA
ATCATTTGCGTTAAATATGTCACATCTGATTCACCGTTATAGTGTTGTAAATTACTATTT
GTTAAAAAAGATATTGCTGTATTAAACGCTAAATCTATCGATTGGTTTAAATTATGATTT
GGATTTAAAAAAAGCCATTGCTGAACTATTAGCAATACAAATGTTATAAACCCCATAAAT
CCATTAAATGCCAGAAAATGTTTGACATATGTTTTAGCTGACATGTGTTCTAAATCTGTG
CCGATAATTTTAAAACACATATTTTCAAATCTAGTAAATATTAAATCTACTCTTGACGAT
TGCACCAATGCTACGCGATATAGATATCCACTAAAAACATACGTAATCATAACCATCATT
GTTAGAAACAAAATTATTTCCATGATAACCCTCACTTAATATATTTCTAAAATTTTTCAC
TACGAATTAAGGCATAAAATAAATACAAAACTAATGCAATAACTACCAGTAATAAAACGA
TGAGCATTGCCATAACCTCCTTACAACACAACAACATCGTAACAACTTGTTTATGAGAGA
AATATTAATTTTCAAACTTAGTTATTAAGAAATCATTAAGATGTGTATGCAGAAATAAAT
TTTATAGCATTTAATTGTGAAGAATATTATGATATTGCTATCGAGGTGAAGGTTATGTCA
AACACTGAATCGCTAAACATAGGAAAAAAGCGTGGATC
LOCUS 14 (D21)
GATCACTGCATCTCCATCATTAACACCGTCATTTTGATTCTCAACGATGAATGGTACTAC
GAATTCGTCAGTTAAGCCCTCATTATAGCTTGCTTCTACACCTTCTTTGGCAGTTGCATA
AGTTGGGGCATCAAAATTACGAATAGCATTGTAAGCTTTTTCTTCACGTTCCCAACGTTT
GTCACGATCCATTGCATAATAACGACCAGACACAGATGCAAATTGACCAATGCCTAATTC
ATTGAATTTAGCTTCAGTCTCTTCGATGTATTTCAAAGCGGATTTTTGATCTACGTCACG
GCCATCTAAAAATGCGTGTACGTAAACTTTTTCAACACCTTGTTTTTTTAGCAAGTTCTAA
CAAAGCAAATAAATGTTTGTAATGACTGTGTACACCACCGTCAGACAATAAACCAAAGAT
GTGTAACGCTGAATCATGTGAATTCACGTGTGCAATTGCATTATTTAAAACATCATTTTC
AAAGAAATCACCGTCTTCAATTGATTTATTGATTCGAGTTAAACTTTGATAAACGATACG
TCCTGCACCGATATTCATATGACCAACTTCTGAGTTACCCATTTGTCCTTCAGGTAGTCC
AACATCTAAGCCACTCGCTTCGATTTGAGTCGTTGGATATTTGTTGTAATAACGATCAAA
ATTAGGCTTGTTTGCTAATTTTACCGCATTACCATGTTCGCTTTCGCGGTTCGCAAAACC
ATCTAAAATAATTAACGCAGTTGGTTTCTTAGCCATGATTATTTTGCACCTTCTAACAAT
TGTACGAAATCTTCAACTTTAAGTGATGCGCCACCTACTAATGCCCCATCAATATCAGTT
TGTGCCATGTATTCTTTAATGTTGTTAGGTTTAACACTACCACCATATTGAATACGAGTT
GCTTCTGATACTTCTTTGCTTGATAAGTCAGCAATAGTTTGACGTACAAATGCACACATT
TCATTTGCATCTTCAGATGTTGATGATTTACCAGTTCCGATTGCCCAGATTGGTTCATAA

GCAATTACAACTGATTTAAGTTGATCTTCAGATAAACCTGCAACAGCTTTCTTAACTTGC
TCACCTACAACATCGTTAGCTTTACCACTTTCACGCTCTTCGTCTGTTTCACCAACACAT
ATAATTGGAGTCATTCCATGTTTGAAAATAGCGTGCGCTTTTTTGTTAATTTCTTCATCT
GTTTCGTGGAATAATTCACGACGTTCAGAATGACCGATAACAACGTATTTAACGCCTAAA
TCTGCTAATGCAACTGGAGACGTTTCACCTGTGAACGCACCATTATCTTCGAAATACGTA
TTTTGAGCACCGATTTCTAAACCTTGTGCTTTTCCTTCTTTAACTGCAGTAGTTAATGCA
TCTAATTGAATTGCTGGTGCACAAATTACTGATTCTACTTCTTTTGAATCTGGTAGTGTT
GGTAATGTATTGACGAAGTCTTTTGCTTCTTGTACTGTTTTGTTCATTTTCCAGTTACCA
GCTATAATTGGTGTTCTCATTAAAGACACTCCTTGTTTTGTAAATATTTTTGAAAAGTGA
TGAAACACGATGTCATCTTGTGACTGTTTTCCCGTAACAATGTTAAACAAACATGCCACA
TCACTTTAAACTATCACTTTATTATTTATTATTGATTGCTTTGATACCAGGCAATTCTTT
ACCTTCTAGGTACTCTAATGACGCGCCGCCACCAGTTGAAATATGAGTGAAGTCATTTTC
AAAACCTAAAGAGATTGCTGCTGCAGCTGAATCACCGCCACCGATAATCGTAATTGCATC
TTTAAGGTTTGCAATTGCTTTACATACACCAATTGTACCTTGTGCAAAGTTACTGAACTC
GAATACACCCATAGGTCCATTCCATACAACAGTGTGCGCACCTTCTAATTCATCTGCAAA
TAATTTTACAGTGTTTGGTCCAATATCCATACCTTCTTGGTCTGCTGGAATTGAATCAGA
TGGTACTACAGTGATTTTGGCATCATTAGAAAATTCTTTAGCAACTTTAGTGTCTACTGG
TAATACAATTTTATCACCATGTTTTTCTAATAAATCTTTTGCGAAGTCGATTTTATCTTC
TTCTAATAATGAAATACCAATTTCTTTACCTTGCGCTTTTAAGAAAGTATAAGCCATACC
TCCGCCGATGATAATTTTATCAGCTATGTTAACTAAGTTTTTGATGACATTAATTTTGTC
AGATACTTTTGCTCCACCTAAAATAGCAACAACTGGTTTATGTGGATCGTTAACTACGCC
GCCAATAAACTTAATTTCTTTATCCATTAAGAATCCAGCTGCAGTTTCTAAATGTGTAGA
AATACCAACATTAGATGCATGCTCACGATGCGCAGTACCAAAAGCATCATTTACAAACAC
ATCACCTAAAGATGCCCAGTATTTACCTAATTCTGGATC
LOCUS 15 (I1)
GATCCTGAAACGTAATTAATTGAAACTGTAGAACCTTCAGTCACCTTGTTGTCTTTTCTA
ATCACTACTACTGGTAAATTTAAAATATTAGCAACCGCATTTGCCAATGAAATACCTTTT
GTCGCAATGGTAACAACAGCATCTAATTTTTCTTCCATGTAAATACTGGCAATTAACTTA
CCAACTTTGTTTAGTAGCGATGGATTACCTACCAAATCTGATAAAAATAAATATCCGCCA
GGTAACAAACGTTCTTTCTCTTCTAATAGAGTAATGACCTCATTAACAACTTCAGTCGCC
TCTTCTTTACTCATCATTGGTTTATACGTAACACCACCACTTGCGCCAGCAGTAGTAATT
ACTGTACCTAACTTTTCTTTTTGGAATGTATTTTTTATAATTTGGACATCTTCACTTATT
GAAGACTTCGCCTGTTTAAATTTTTTCACAAAAAAAGTTAATGGAATCAATTTATTCGGA
TGGTTCATCAAATATTGCGTCATAAAAACAATTCTCTCGCTTCGTTTATATCTCATCTTT
TCAACCCTTCTATCCTAATAGTCTAACTAAGTACACTTCATTACAACAACCGTTAACTGC
ATTATAAATATTTTTTGCTTGGCTTTCTTTTCGTGCTAGCCCATACACAGTAGGTCCGCT
TCCACTCATTAACGCACCATCTGCACCACTTTTCAACATATTATTTTTTAATTTATCGAT
TTGTGGGTGTTTTGAAACAGAAATTGGCTCTAATCGATTAGACAAACTTTGACATAATTG
TTGATAATCTCGATTTTCTAAGGCCTCATAACACATTTTCGTATGTACGTCGTAACGCTT
ATCTAAATTAATCAACTTAAATATATCTGGTGATGATATGCCTAAGTTTGGTTTAGCAAG
AATCACCCAAGCTGAAGGTGGTTTATTTAAAAACTCGATTTTCTCTCCTCTTCCAGTACA
TAGTGCAGTTTTATTATAAATACAAAACGGAATATCTGTCCCGATTTTACTGCCTAGTAG
AGCCAATTCTTCCAAACTCGCCCCTATATCAAAAAGTCGATTCAATCCTCTTAACGTTGC
TGCTGCATCAGCCGAACCTCCAGCTAAGCCAGCAGAAACAGGTATTTCTTTATCGATAGA
AATTGTTACACCTTGCTTTAGTTGATATTGCTCAATAAATAGTTGCGCTGCACGATATGC
GAGATTTTTATGATTAGAAGGCACATAATTATGTTCAATCTCAACAACTATCTTTCGATC
TTTTCTTTTATGAAAAGTTAAACGATC
LOCUS 17 (I3)
GATCGACAACACTCTAAATATATAGAAAATAGGTATTAATTTAACTATAAATCTAAATAA

TAATGCAAAGATGATTAAAATAACGATAGCTAAAGCAATACCAATAATAAAATCTTTGGT
CGCTAGCTCACCTATCATCCCCATATAGAAAATGATAACCTCGACACCTTCACGCAACAC
AGATATTAAACCAATCGTCGCTAACAATACCAAATTACCATTACTAATCGCATTAGCATA
CATATTTTTAATCATGTCATTCCAACGTTTTGCATTTGAACGTTTGTGCATCCAAACACC
AACGATAAACATTAATATGACCGCAACGATACCTAATCCCGCTTCCATACTTTCACGAAG
AATGCCACTATTCCCTAAAGTTTCTACAAACGTAATTGCTAAGATAATACTCAGTACAAG
TCCGGCAATTGCACCACCAATCACACTTGCAGTCCCTTTCTTATCTTTTACATTACGCGT
CATGGTAGTCAATGTCATTACAATTAACAACACTTCTAGCCCTTCACGTAAAAAGATAAT
CATCACATCGACGAAGCTATAACTATGGCCAACAACCTCTTTAATTTGGTTATTTAAATC
TACTAAACCATCTTTCACATGTGCTTTATTATGTTCGTCTAATACACTTTGATAATATGG
TATTTTATCTTCAATTTTCGTATACAAAGCACCGTCTTTAGTTTGAATTTGACCTTCAAC
ATACGGCCAAGTTTCTATAAAATGTGTAAGCGCAGCATCAGCATCCGACAATTGATTGTC
GTCGATAGCTTTAATCGCCTTCTCTAACGCATCATTTAATTGTGATACATGGTATTGATC
ATTTGCAGACGTATTACTTTTTTTATCGACATGATCAATATTTGATTTAAAAGTTGTCCA
AGCATGTGACACTTTTGCCGTATCTAATGGTGACTTATGAATTGCAATTCTAAGTTGTAA
TAATGCGACTTCAATTTGTCCATATTGATTTGCGTCATAATTGCGAATCACTGTTTCATT
ACTTGTCCAAATCTGATTCAAACTATTGTTCAAAGATTCTAATTCCGCTTTATTTTTATC
TTTAATCGCTTTTGTCATCGCAGCATCTTTAGCATCGACTTGCTGTTGCAATAGTTTAAT
TTTAGAACCCGCATCTTTACTAGCCAATTTCTCTTCATAAGCAATTAATGACTTCGTTAA
TTGCGAAAGTGTATCTTTTTGATTATCATTCGCTTTTGCATCTTCAAGCTTTCTCACATC
TGATTTGACAGCATTACTTTCACTATTATCTTCAAGCGATAATTTCTTAACTGCACTTAC
CACTTGCTCAATTGCTTTCTGCTTATTGTCATTCGATATCGAATTATTAGAAAGTGCAGA
TTTCGCATCCGTTATCACACTATATACATCACTAATACTTTGTTGTTCTGCTGCCTGACT
TTTCAGTAACCCAAAGCTACACACCATAGCAGCAGTTATTAGCATTGCTACAAATTTAGT
CAAATAATGTTTCACCAAGGTATCCTCCCTTACTAACACCTGGTAATACTAAAAATGAAG
CAGAACCTCTATGTGTAATATATTCATTTAATTTATCATTACTACCTAAATTATTTTGTA
TATCGATAAATTGTTTTGTCGCTTTTTGAAAAGCAATAAAAAGTAAGCCTGTTTCGAAGT
TACCTGTGCGGTCATCCGTACCATCCACATAATTAAAGGCTCTACGTAAAATTGACGTAT
TTGCTTCTTTCGCTAGCCTCGTATGGGCATCTTTATCAATAATATACTCGCCATGACTAT
CTTTCGCTTTTAAGTCAATTTCATCAAACTCTTTCCCACCTGTTAACGGTGCACCACTAT
GTCGTTTCCGACCAAATGTAGCCTCTTGTTCTTCCAGCGCAGTACGATC
LOCUS 18 (I5)
GATCGTTTAAATGTTCAATATATTCCGCTGCACTTTGCGCTGCAATACTACCATCGCCAG
TAGCAGTGACAATTTGGCGTAAACCTTTGTCGCGAACATCTCCTGCTGCAAAAATACCTG
GTACTGATGTTGTCATATCATCTTTTGTTACAATATAACCAACATCATTTGTAATACCTA
AGTCTTTAAATGGCGCTGTTAATGGTTTCATACCAATATAGATGAATACACCATCAGCCT
CGTGTGTTTCTTCTGAACCATCTTTTGTAGACGTTAATGTCACAGAACCCACTTTGCCGT
CTTTTTCATTAATTGATTTCAAAGTATGACTCCAAATAAAGTCGATTTTATCATTTTTGA
ATGCTCTATCTTGTAAAATACGCTGTGCACGTAACTCATCACGACGGTGAACGATTGTTA
CTTTGTCAGCAAATTTAGTTAAGAATGTTCCCTCTTCTACTGCTGAATCACCACCACCGA
TAACGAATAGGCGTTTATTTTTAAAGAATGCACCATCACATACTGCACAATAACTTACAC
CGCGTCCACCAAGTTCTTGTTCACCCGGAACACCAATTTTCTTGTATTCTGCACCTGTAG
CAATAATAACCGCTTTCGCTGTTAATTCTTTATTACCAAAGTTAATCACTTTATATTCGC
CTTTATCTTCTACAGATTTAATATCTCCATATTGATAAACTGCACCAAACTTTTTAGCGT
GTTCAAACATTTTTGTAGATAAATCTGGACCTGTAATCATTTCGAAACCAGGGAAGTTCT
CTACTTCTTCTGTATTAGCCATTTGACCGCCTGGAATACCTCTTTCAATCATAACTGTTT
TTAAATTAGCACGTGATGCGTATACTGCAGCAGTCATACCAGCTGGACCTGCACCGATAA
TTGCTATATCAAAATCTATTTCAGTCATTTTATTAACGCCTCCTCATTATTAATCATTAT
GCGCATTATATAATAAATCTAACTTTTCATAAATCTATATGCTCAAGAGAAATTCAATCA
TTTTGTTCAGTTTATATTGTGTTATGCCTAACCATGTTGTAATTTGCTTCTTTGTAACGT
TTCGAGGTTGATTTTTAAAATACAAATAAATAAACGCACCGATATATGGCTCAACATCAG

TTAAATCTACTTTTTCAGCAATTATGAGTTCACCTTGATTAATCCATGCAACCATTACAT
CATTTTCACTTACAAATAATTCATTATGGTAAAGCGTTAATAAGCCGCGATGAATGAAGT
CTAATTTATTGAGCGTTAAACCTTGAACTAAATACGTTAAATACAATTTCTCATAATTAT
TTAGATTTTCCAAAACCTGCCAAATACTTTCCGTCATCACAATTTCTTTACCATTTAATT
GATC
LOCUS 19 (I8)
GATCGTTGATTTGATTAGTGATGGTTGAACAAATTAAAAATAAACTACTTACTGCAAATA
CTACGCCCATAACGATAAACGTAGTAGCTGGTGTAGTATAACTTGTAATGGCAGCGCCAC
TAAGACTGCCAATAATTTGACCAACAACTAACATACTGTTCGTCGTTCCAACAAATGTGC
CTTTAAGTTGTTGATGACACGCATTCACGACAACAAACATGACACTTTGAATCAATGCAC
TATATGTTAATCCTTGAAGTATTCTTGCAGCCATTAAAAACTCTATATTCGTCGCTAAAC
CTTGCAGTATCGCACTACAACCACATGCAATCGTGGCAAATATATATACTGATTTAACAT
ATGATTTATCATTAAAGCGTCCCCATAAAGGCGCGCTTAATATCGAAGCCGTCCAAAATG
CGGACTGTAAAAATCCAATCACACTACGGTCATCTATCGCTGTATGATTCACTGATGAAG
CAAGTGGTGATAATGCAGTTAGCATGCCATACATAGCAAAGTTTGCTAAAACGCCAACGA
TAATAAATCGACATGTTTGTTGTGTGCATAATAGACATTGAAATGAACGGCGAATACCTT
TATTAATATTTGGTGTTTGTGATTTTGGCATATGTGTCGTTTCAATCAATTTTAATGCAC
CGAAAATACAGACAATAAAAGTAATAACGGCAATACTCATCAGTAACGCACTAAAACCTA
ATATCGAAGCTGTAACACCGCCAATTAATGGCCCCACAAGAGACCCTGCGCTGACTGAAC
TTTGCAGTCTTCCTAATACCTTTCCACGATCTTCAGCTGGCGCCTCTGCACTCGCAAACG
CACTTGATGCATCAACAACACCACCAAATAGTCCCTGCAATAACCTCACAAGTACAAACT
GTAATGGTGTCGTACACAATGCCATTAAAAATAAGCATACCGCCAAACCAAGTAACGCTC
TTAACACCATCCATTTTCGGCTGATCTTATCACCTAGCTTCCCCCATATCGGCGAAGCTA
TCATCGTCGTTACAGCTGGAGCAGCAATCGCTATACCACTCCACAACTGTATTTCTACGA
CTGATAGATTTTGTAGTGATGCCATATAAATTGGCAATAATGGCACAAGTACTGTCAGTC
CAGCAATCGCTATAAACTGACTGAGCCATAAAATGCGAAAGTTACTGCGCCATATAGACT
GATTAATCATATGTCACCATTGGATTTGGTACGGTAGTTAAACCTGAAGGCATACTACCT
CCACCACTATCACGTTGATATAGCAATGGTAATAAAATTTGTTTGAATGGCCACGTCTGT
TTATCAAATAAAATGTGTCTGACAGCTAGCTGATCAGTTGTAACCCAGGAAATAGTTGCC
ACTTCATTTTTTAAAATTTGTTTTAACAACGACATAAGTTCATGCTCACTTACACCAAAT
AAATCTTGAATTGCATCAATAATGGCATATAGATTTACCGATACAGCTAATGTTTGAAAA
TAAGCAAAGAATGTTTCCAAATCCTCATTAATTAGCGTATTAGGTGTATCTTCTCTGACG
ACATACTTCGGCAATGAAAGCTGATGTGCTGTTAGCCATGGTTTATAAATTCTGACAGTA
TCATGATCACGTAACACGCATTTTTGTACACGTCCATCTTCAAATGACAACAATATATTT
TGACCATGCAACTCTGGTAATGCGCCGTATTGCATAAATGATAGTGTTACCTTTAAAAAG
ACTTGCGCGATATCTTCAAATAACGTCATGACATCATTTTTAGAAATATTATCTTTTCCA
CAAATCATTTGATATAAAGTGCGATCATTTGCCGCGAGTGCTGCCATTGACACTAGCTGT
TGCGTATCATTTTTGGCTAGCACTTCGGGATACTTTCTTAGCTGAACAGTTAGATGACCT
AATTGATCTTTGAAAATATCATTATCTTGACCCATATATGACCACCAAGCTGTTTCATCA
CAAACCATGACATACTTAGCTAGTGCTTCATCTTTTTTCTATAAGCTGACGTAATAATTGT
TCTGCTTGTTCTCCGTTTTTTCATGTAACGCGTAGGCGTTAGCCTTAATGCGCCTAATGAC
TGCATTGCAAATGGTACTTTGACATGGTTATACGGTGCGCCAATATCAATTAATGAACGC
ATACTTGAAGACGACAGATAATCTCCAAATTTTAACGGTAATAGTACAACCAACTTTTCA
CTAATCTCTTTCGCAAAGACGTTCGGCAGAATATGCTGATATTGCCAAGGATGTACCGGA
AATAGTACATAGTCATCTATTGATAACCCTTGATCATTTAACATGTCTGTCGCTTGTTCT
TTTATAGGTACTGTCAAATTTTCTAATTCATCGATATTTGCAGTATCGCCATGAATCATA
TGTGTCTTTTTAACTGCTGCAACCATTAAAGGAAATGATTGATTTAATTCAGCTTGATAC
ACTTGATAATCCGCTTCTCTTAATCCTCTTTTTTCTTTAGCTAATGGATGAAATGGACGA
TCTTTTAAACTTGCAAACTGCTCTGACATCACAAAAGGATGTGACGCTAAATCTAATTCT
GATAATTGTTTAGCAAGCTGTGTGGCAGCAGTAGTCAGTCCTTCTTCAACGCGAGCCACT
TCCCATTCATGACTTAGATCACAATTCATATTAGCAATTGTTTGCCAAAATTCAGCTGCC

GTTAAAGGTTGCTTAGACACCCTTCCCTCTATCGTAATTGGTTGTGAACTTTCGTAACGA
AACATATTTAAAGCACTAAAATAAACAGGTATCTTTATTTGTTGTGTTTCACGTTCGTAT
ATCAAAAGCGTTTGTCCGTTTTCTTTAGTAATCTCACTATTCGATACAATTCCGGCTATA
TCTTCAAATAATAATGCATCAACTAAATCTCTTAATATTATCGCTTGTGCTGTATTGACT
GCTGTATGATTCTGCAATGTTCAGACACCTCGCATTCTTAATATAGGTTCAATGTTGTCC
CAATATTTTGTTGTTGTGCCTGTTGATAAATAAAATAAGCACTTGAAATATCTTCGATAG
CCATACCCATCGGATTAAGTAATATGATC
LOCUS 20 (J7/M10)
GATCGCTTACAAAACATAACAAGCTTTAAAGATATTGCCAAAATTCTTTATTCAACGAGA
GCAGGCGTTGCTTATATGGCTACAGGTGGTATGGCTGGCGCTTTACGTGCCACATTAGAT
TATGTCACTGAGCGTAAGCAATTCGGCAAACCAATTAGTAAATATCAGTTAATACAAGAA
AAGCTAGCAATGATGCAAGGTAATTTAGCTCAAGCAATGGCAACATGTGCTCAATTAGCT
AATATGCAAGCACATGGTGAATATGACGAGGTTGCAACTTCAACGGCGAAGATGATGAAT
GCCTTACGTTTGCGTGAGACAGTAGCTATGGGCCGCGGTATTACAGGTGGTAATGGCATA
CTAGCTGACGATTATGATATTGCACGTTTCTTCTCTGATGCAGAAGCGATTTACACGTAC
GAAGGTACACATGAAATTAATGCCTTAGTAATTGGACGCGCTTTGACTGGAGATTCTGCT
TTCGTATAAATAGCAAATAATTATATGAGATGCATTAATTTCACTAAAAAAGACTTATTT
TAAGCATAAAGCTTTTTCCTTAAATAAGAGGCTAAGATGACTGTCAAAGATACTTAATTA
ATTTTATAAAATAGCAACGTTATTCCAATTATCTTAATGGTTATCTTATCCTCAACTAAA
TTGGAGGAATCACTATGACAATTAATAAAGTAACCGTTCTTGGCGCAGGCACAATGGGCG
CTCAACTGGCAGCACTTTTTGTGAATGCTGGACTTAAAGTAAAACTATTAGATATTGTAG
TGGACAAAAACGATCCAAATCTCATTGCGAAAAAATCTTACGATAAAATTACAGATAAGA
AACGGCCGCTACTATTCGACTTAAATCTAGCGAGTCATTTAACATATGGTAATTTTGATG
ATGACTTGGTAAATGATGATGCTGATTTATATATCGAAGCAGTCAAAGAAGATATTGAAA
TTAAGCATGCTGTTTGGCAACAAGTTCTACAACATGCTAAAGAAGATGCTTTATTCGCTA
CAAATACATCAGGTATTCCAATTAATGCGATTGCTCAAGCATTTAACGAGAAGGATCAAG
AACGATTCTTTGGTCTACATTTCTTTAACCCACCACGTATTATGAAATTAGTGGAGTTAA
TACCTACGTCACACACGAAGGAATCTATTATATTAGATGTAAAAAATTTCGCGCAAAATG
TGTTAGGTAAAGGTGTCATTGTCGTCAATGATGTGCCTGGCTTTGTCGCAAATAGAGTCG
GCACGCAAACAATGAATGATATTATGTATCGCGCCGAGCAACACAAGATAAGCATTGTAG
ATGTGGATGCTTTAACTGGGCAAGCGATTGGTCGTCCTAAAACAGGTACATATGCGCTAT
CTGACCTAGTCGGTTTAGATATTGCAGTGTCTGTAATTAAAGGCATGCAACAAGTACCTG
AAGAAACACCTTATTTTCATGATGTCAAAATTGTAAATACGTTGTTTGACAATGGCGCAC
TCGGACGTAAAACGAAACAAGGATTTTACAAAAAGGATAAAGAAACTAAAGCTCGACTTG
TTTACGATGTTGAAAAACAAGATTATGTACCTGTATCGCAACCACAATTACCAATTTTAA
ATGAATTTAATAAAGACTTAGTGCATAACCTTGATACCATATTCAATGCGCAAGACGAAG
CGGGACTATTTTTATGGGAGACATTACGTAATAATTTCTATTACTCTGCTATCAATGTAC
CTAAAGCTACCGATGATTTCCGAGACATAGACCGTGCGCTTGTCTGGGGGTTCAACTGGA
AACTTGGTCCATTCCAATTATGGGATGCAATGGGATACGAACGTGTTAAAACACGTATGG
AAGACGAACTTGGAGACTTACCACAATGGATTAGTGATTTAGATGGTGGCTTTTATAAAC
AAGATGAGACCATTGAATATGCAACACCTATTTCTCACTTCGTAAAAGATGAACTTTGGG
ATAAAGGTGATGCCAAACTTTCCGTAACTCATGATGATCAACTGTTACTGAAATTACAAA
GTAAAAATAATGTCATTACCGATGAATTCAACGATGCGTTAGTTGATGCGATTGATTTAC
TGGAAAATGACCATTACACAAGTATGGTTATTTATGCAGATGGTAACAATTTCAGTGTGG
GTGCTAACCTTTTCTTAATGAAAAAGGCGCATGAAGACGGTCTTGTAGATGATGTCGTTG
CACAATCAATTGATAAATTACATTATAGCTTTAATCGTTTGAAGTATAGTTTGAAACCAG
TAGTCACAGCTGTTCAAGGTCGTGCCTTAGGCGGTGGCTGTGAGCTTGTACTTTACTCAC
CTATTGTTGTCGCTGCAAGTGAAACATATATCGGTCTTGTTGAAGCAGGTGTTGGCTTAT
TACCGAGTGGCGGTGGCCTTGCAGAAATGGCTGATCGCATATTACGCACATCGCATAAGT
TTGATGACAAACAAGCTTCCATGACAAAAGTACTGACGAATATCGCATTTGCGAAAGTCT
CTACAAATGCCTTTGAGGCACGTCGTTATGGTTATTTACGTGATACAGATACGATTATTT

TCAATACAGCACAACGTGTCGAAGTTGCGCTCAAACGTGCGAAATATGAAGCAGAAACAA
ACTATATTCCGAATCCTAGACATCAATATATCGCTTTAGGTGAAGACTTCAAAGCATTGA
TCCAAGGACAATTAGATGCGCAAAGACGGGGTCATTTTATTAGCGACCATGATTATCATA
TTGCCTTAAATATCGCCACAATTTTAGCGGGTGGTGATTTACCAAGAAATACATTTATCA
ATCAACGTTACATTCAATCGTTGGAGAAAATTGGCTTTATTGACTTACTAAAATCTAAAA
AATCATATGAAAGAATTGCACATATGTTAAAAACTGGTAAGCCATTACGTAATTAAAAGA
TAGTCATTAAGAGAGGATGATAACCATGCAAGAAGCATACATTGTAGCTTATGGGCGTTC
AGCCGCAGCGAAAGCAAAGCAAGGCGCATTATTCCACGAAAGACCTGATGATGTCGCAGC
CAAAGTATTACAAGGCGTATTGAAACGTATTGACGGAAAATTCAATAAGAATATGATTGA
AGATGTCATTGTTGGTACGGCTTTTCCAGAAGGATTACAAGGCCAAAACATTGCACGAAC
GATTGCATTGCGTGCGGGATTATCTGACACGGTACCGGGTCAAACAGTGAATCGCTACTG
CTCATCAGGATTACAAACCATCGCGATTGCAGCCAATCAAATTATGGCTGGTCAAGGAGA
TATACTTGTAGCTGGTGGCGTTGAATTGATGAGTGCCGTACCAATGGGTGGCAACGAGCC
CACAAACAATCCAACCTTACAATATGATGATATAGGTGCGTCATATCCTATGGGTTTAAC
TGCTGAAAATGTAGCATCCCAATTTGACGTATCACGCGAAGATCAAGATGCTTATGCTGT
CAGAAGTCATCAACGTGCCTATGACGCACAACGTGATGGTCGGTTCAAAGATGAAATTAT
TCCAATACAAGTAAACTCAGTTGAATATACAAACGCAGGACCAAAAGTACACACAAATAT
CTTTGACCAAGATGAATTTATACGCCCTGACACCACGATGGAGGCATTAGCCAAATTACG
TACAGTATTTAAAGCTGACGGCACTATGACTGCAGGAACATCTGCCCCACTTTCTGATGG
TGCAGGATTTGTAGTTTTAATGTCTGGAGATAAAGTGAAAGAACTCGGCGTGACACCTAT
TGCACGATTCGTTGGTTTTAAGGCAGTAGGCGTTGACCCGAAAATTATGGGTATTGGGCC
TGCATATGCGATTCCTGAAGTATTGTCACTCAGCAATCTATCTGTTGAAGACATTGATTT
GATCGAATTGAACGAAGCATTTGCTTCTCAAACGATTGCATCTATTAAAGAAGTAGGTCT
AGATATATCACGTACGAATGTGAATGGTGGCGCTATTGCTTTAGGTCATCCATTAGGTGC
TACAGGCGCAATGTTAACCGCGCGTTTACTTAATGAAATGGGTAGACGTCCCGATAGCCG
TTACGGCATGGTTACGATGTGTATTGGTGTCGGCATGGGTGCAGCTGCTATATTTGAATA
TGTGCGTTAGAATGGTTGATTTTGGATGAAGCGGATTCGTTTTGTTATTGAATGAAGTAG
GCTGAAGTTGAAGCCAGTTGAAGTTGAAGCGGGTTGAAGCAATTTCGTTTTATTAATGAA
GCTGTGTGAAATATAGTGATTGAACAAAAAAAGTGGTTTAATGGGATGGTGGTTATTTCC
GTTTTAGAATTTAACATTTACACGTCTAATTTTAATCATTGTTTTAAATTTTATGAATCG
AAGCCCTTTGATTTAATAATATTTGCTAATGCTAGTAACTTATCTGATTGTTCATGTTTA
AAATAAAGAAAACCACTCACATCAGTGTGTGTTCGAACTAGACTTGTAAGTTCCAGTTCG
GCACGACTTTCTAAAGCAATTATTATTGCTGTGATTGTCGTATATCACTTAGATGTGCGT
GGTTTATTTTAATAGGTTAGTAATATATTAGGTCATGTTATGTTTAAGACTATAATGAAT
AAATAATTTAGAAATATGCTTCCGATTGTTCGATGCTTTAATTCAGTTAGAAGCATCATA
GAATGCATGATTACTGTTGTAAAGATACGTAATGTTTTGTATTGACTGTATGTCTTTGGA
TAGAGTTACAAACTTATTTTGTTACTCTAGGCCCATATGTCGCAGTACCATCTGCATGTG
TTGTTACATTGTATGCATTTGTTTTACTTGGCTTCTTGTATGTCGGGCGAGCTCCGTATG
ACACTTGACCGTTTGCATGTGTTGTTACGTTGTATGCATTTGTTTTGCTTGGCTTGTTTT
GTGTTGGGCGAGCGCCATATGATACTTGGCCGTTTCCATGTGTTGTTACGTTATATGCGT
TTGTTTTGCTTGGCTTGTTTTGTGTCGGACGAGCTCCGTATGATACTTGGCCGTTTGCAT
GTGTTGTTACATTGTATGCATTCGTTTCGCTTGGCTTCTTGTATGTCGGACGAGCTCCGT
ATGATACTTGACCATTTGCATGTGTTGTTACGTTATATGCATTTGTTTCTGATGGCTTAT
TGAATCTTGGTCTCGCTTCATATCCAAATGTTCCATCGTTGTATTCACGGATACCTGTAC
CAGCATCTCTATATTTAACATATTTAGGTGTTTTGTTAAATTGCGGTCTCGGACCATATT
GAGAAGCTTCTGTTGTTTCAGTTGCTTGAGGTTTAACTTCAATATCACTTGATTCTCCTT
GAGTACCTTTTAACGTTGATTCAGTACCTTGTGGTTTTATTTCAAGTTTAGATGAGCTAC
CTTCAAGACCTTCTAAAATAGGGTTCGTTAACGGTGGGTTTGTATAATTATTGCTTAATG
ATGGGCCGCTTTGTTCCATTGTTAGAAAATCGGGACCTTGAACGATTTCACCTTGTACCG
TTTTATTTTCCATCGTTGGATATTCCGGACCTTTTACAATTTCACCTGTAATTGTGCCCT
GTGGAATTTTAACTAATGGTTGTGCAACTGGTTGTGTTGTTTCTTCAGCTTTACCAGCCG
TAGTTTTAACCTCTTGTTGGTTATCAACTTTAGGTGCTTGAGGTTCTTCAACTTTCTTCT
CTTCTTTTACTACTGGCGATTTTGTTTCAGTTTCTCCGTATTTTTTGACAGTTTTCTTTT
TCCAAGAATCATCTGCTTCTTTAACTGCTTTTTTCGTTTCTTCAACTAATTTATCAAAAT

TAGGTTTATTATCACTATTTGTTTTATAGTTATGTGTTGTAGGATTATATTTCGTTATAG
ATTTCGGTCTATTTTGTTTAGTTTCCATAAAGAAATCATCAATAATTGAATTTAAGTCAT
CAATCATTTCTTTTTTAATACGTTCATTTGTAATTTTATGTGGATTGTCTGTATCTCCAA
GGATTAAGTCCAGTTTTGCTCGTAACTCTTTCGCGTGCTCCCCATAATCCTTATCACCAT
AATATGATACAACTAATGTATCAATTTCAGATACGAGATCGTATACTTCCTTAGTTGCTT
TATCTTCTTCTGCTGCATTAAAAGTTTTCAAGTCTGAATTCTTATCCTTAATATCTTTAA
CTTCTCTGTGAAAATCATCCAGTGCTCTCTTTAATGCATCCTGTAGTTCATTGTATTCTT
TCATCGAAAGTTCTTCTAAATTATATTTATGAAAATTAGCCATTTTTAAATCTGTACGAG
GATTTTCTTTTTTATAATTTGCATACCATTGTTTATAATCTTCATATTGAGATTTCTTTC
TCTCCAAAAGATATTGATCTTCCCTTAATACCTTTTCCAACAACCTATCTTTAGCTTCTT
TATAAATATTATCTCCATATTCATATTTATTAGTTAATCCTATAGCATAAATTATATAGT
CTTCCAAATAATATAGAGCTGAATTTAAATATCTGCTATCTATTAATGTCCCATTTTTAC
TCCCAGCATTAACTTGTGATTTCCCACTATAATCCTTTGTTACTATCGCATCTGCTTTGT
TATCCCATGTAAATAAGCTAGATGCAACTGCTAATGCGCCTAGCGAAATTATTTGCTTTT
TCATAATTTTTTAATTCCTCCAAAATGTAATTGCCCAATCTACATTAAAGAAACAAAATA
TTAAAAGACATTAACTATATATTAACTAGAATAAACAAAGCATTAACTATCTTTTTGTTA
TAGTTAATTAGCTTTGCAATATACAATAGTGTATAATTTTTTTGATTAATGTACATCAAA
GGAGTAACAAAGCATGACAACACAAATGAAAATCAAAACATATTTAGTTGCTGGTATTAA
AGCGGCGCTCCTTGATACGACTGGTATTAAATTAGCAAGCAAATCTGAAACTACATCACA
TACGTATCAACATCAAGCGCTTGTAGATCAATTACATGAATTAATAGCAAACACTGACTT
AAATAAATTATCGTACCTAAATTTAGATGCGTTTCAAAAACGCGATATTTTAGCTGCGCA
CTATATTGCAAAATCCGCTATACGCACTAAAAATTTGGATCAAATGACTAAAGCGAAACA
AAGATTAGAAAGTATTTACAATTCAATTTCTAACCCTTTGCATTCACAAAACAATTAATA
ATTCACCAATAAATCATGTAAGTGTTTGTGACGCCAAATTGCCATACAAATACTTGTCAT
ATGAATATAAACGAATGAAACGATTGCCTATCCCATAGATGGCAACATTAAAAAGACCTC
TGAAGGTATCATCTTGATAACTTTAGAGGTCTTTGTTTATATTATTCAAACAAAATTCTT
ATAGAACGATCGAAGTATGTTTCGTCTTTCTTTTCTTCTTTAATCTGATCAGCTAATGCT
GGGTCATCTGTGATAATACCATCAACATTGGTTTGTAAGTATTTCGTTAAATCTTCTTCG
CCGTTAATAGTCCAAGTATAGACTTCTTTATTTTCCAAGTGCGCTTGATTAACAAGTCTT
GGCGAATAAGAAAAATCTTCGATGACAAAGAAATCTAATGATGTTTCTTTAAAATGACCA
AACTGCAACGGAATGATATAACCACACTTGAGATATGGCGCTTCTTTTTTCAACTTAGTC
ATCACATCATAATCCAAAGACATCACACGATATTGATGTTCAACACCATGCTTTTTCAAA
ATATCAATAACACGTTGTGTATAATCTGCTGGTTCTTTACCATGTGGCTTTAACTCTACT
AGTAGCTTCACATTTGATTGTTTAGCCGTTTCAATAAATTCGTCTAAGGATACAAATTTT
GCTTCATGTCCATTTTGACGCATTTTCAAACCGACGATATCTTTGAAATTAGATTCAGAA
ATATTTTTATTAACACCTGTTAAACGTTTCAAATTGTTATCATGACTAACAACAAATTGT
TTATCTTTCGTCATAATTGTATCTAACTCAACGTATTCGACATTCGCTTTTGCAGCAGCT
TTCAATGACGGAATAGAATTTTCAACACCTTTATCTTCGAAACCACGATGGCCAATAATG
GAGATATTTGTATTGATAGTATTATTGTAAAGTAAGTACATGTTATAACCGATAAAACAT
GTCACTGCAAGCACCATTGAAATTATAAAGAACCTAGACTTCCGTTTCGGTTTTGGATAT
TTAAATTCTAAGCCCGGTTGGTCTAATACATTCTCTTGTTTTAAGTGCAGTACTAACACA
CTGATTAATGATAATTTCGTAAATAAATAATAGAAGAACAATGCGCTTTTCAATACAACA
AATAAAATTGATGAGACTAAAAACTTATCTCCTTCTTCATCTACACAAATAGCAAGATAT
GTTGCTCCTGAAATAATTAATGTTAAAATCGCACCAATGATGAGTTCTAATATAACTATT
TCTATAACAAGCCGAAACTTATTTCGCTTCGTAATTTGCCAACTTAGTCTCATATTTTTA
AATAACGACTGGCGGTTTAAAATCGTTAACGGTAGAGTAAATATTAATTTAAAATTTAAT
ATAAATACAGCAATCATAAAGGTACCGTAAATGATTATACCTTTCGTCGTTTTCATAAGT
TCTTCCGTTAAAAATTTAGGTATGTAAATATTTTTTGTTAATACTGAACTTAGTCCTAGG
TTGGCAATGGGTATCATTAACATTAAATAAATGACAAAGAAAATAACTGGTACACCTATG
AGTTTACGCACATTTACAAAGGCATTTTTAAAAATGGATTTAAATGTAATAATCTGTCGA
TCAAAGCCGGCATAAACCATATAAACTAACAATGAAAACTCTACATAAATCAGAAAGGCA
ACACTTAATATGAATATAATAAGAAGTATCACACTGGCGGGATGACTAACGATTTCCGTC
CAATTGTTAATCGTAAGTTGGCTTTGCCCAGCTACTTTTAACATCATATTAAATAGTAAA
ATTAAGTATGTACTACTAATAAAAATCATGATTAACTGCAATAGTAAGGCATTAATGCTA

AAACGCCCTTTATTTTGATACAGTAATTTAAATACTGCCCATATATCTTTACTAATTCTC
TTCATAATCACGCTCCGCATTGCTTTAATATTAAGTTTCATCTTAATATTTTTCATTACT
CAGGGTCAATAAAAATTTGAAAAGACTCATATTCATATGCAAGTAGCAAATAATAACCCA
TTCAACATCAGCTAAATGATGATATTGGAACCCCACCTTTAACAAGACATCACATTCTTT
ATCAGCATAGCTACTTACAAAAACGTCTTCCTTCAACCATTGTAGAAGTTGTCTCATATA
CTTACTACGTCTTGCTAATACTCAATACTCAATTGAAAAAGAAGCATATGCCCCTTCACT
CTTGAAGTTGCATATGCTTTCTTTTCGGTCTGAATTGTATTTATAATTCAACGGGAATTT
TCCCTTTGAAGTTAACATAACGGTAGGCTGCTTTAACAGCTTCATCATCGGGCGCTTCGA
CATCTTCTAATTCATATGCAATGCCCAATGTTTTCCACTTATGAACACCTAACTGATGAT
ATGGCAGAATTTCAAACTTTTCGACGTTATCAAGAGAATTAATAAATTCCCCTAGTTTAA
TTAAATCGTCTTTATCATCAGAATAACCAGGCACAAGGACATGTCGAATCCATACAGGTT
GTTTCATATCTGACAGTTTGCGCGCGAAGTTAAGGATGTGTGTATTAGGCTTTCCTGTCA
ATCTAATATGTTTGTCATTATCAATATGTTTTATATCTAATAATATCAAGTCTGTATGTT
TTTGTAATTCTTCAAAATGCCTTTGAAATGCTTTTGTATCATTAGCACATCCAGCCGATG
TGTCTAAGCAAGTGTGCACACCATTTTCTTTTAATTCTGCAAATAATTTTTCTAAGAATG
GCATTTGTAACAATGGTTCGCCACCACTGACTGTTACACCGCCACCCGATGCATCAAAGT
ATGGTTTGTATGGTAATATTTCATTCACCATTTCATCAACTGTGACTTCTCTTGATGGCT
CACTAATTTTCCAAGTATCTGGATTGTGGCAATACAAGCATCTAAGTAAGCATCCTTGTG
TAAATAATATATATCTTAATCCCGGTCCATCGACAGTACCTAAACTTTCGACAGAATGTA
AGTGTCCCTTAAGCATAGTGCTCCCACCTTAAATTTTGTTACATACTTTCATGGAATGTA
CGAGAAATTACATCTAATTGTTGTTCACGTGTTAATTTAATGAAGTTAACAGCGTAACCA
GATACACGGATTGTTAACTGTGGATATTCTTCTGGATGTTCCATTGCATCTATTAATGTT
TCACGGTTAAATACGTTAATATTTAAGTGGTGACCACATTGCATTGCGTAACCATCTAAC
ATACTAGTTAAGTTACGGTTTTGATCTTCTGGTTCTTTACCTAATGATTTTGGTACGATA
CTGAATGTATTTGAAATACCATCTTTACAGCAATCGTAAGGGATCTTAGCTACAGAACTT
AATGAAGATAATGCACCTTTTTGGTCACGGCCATGCATTGGGTTTGCACCTGGAGCAAAT
GGTTCGCCAGCTTTACGTCCGTCTGGTGTGTTACCAGTTTTCTTACCGTATACAACGTTT
GAAGTAATTGTTAATACACTCATTGTATGTTCTGAATCACGATATGTTTTATGACTACGT
AATTTAGTCATGAAGCGTTCTACTAAATCAACTGCAATATCATCTACACGGTCGTCATTG
TTACCGTATTTAGGGAAGTCGCCTTCGATTTCAAAGTCTACTACAAGACCTTCTTCGTTA
CGAATTGGTTTAACTTGTGCATATTTAATTGCAGATAATGAGTCAGCTGCTACTGATAAA
CCAGCGATACCTGTTGCCATTGTACGTACAATTTCTGTATCATGTAATGCCATTTCAATA
CGTTCATAGCTGTATTTATCGTGCATGTAGTGAATAACATTTAATGAGTTAATGTAAACA
CCTGCTAGCCAATCCATCATTTGATCAAATTTCTTGAATACTTCGTCATATTCTAATACT
TCGCTGTTAATACCTTCGAAGTTTGGACCAACTTGTGCACCAGATTTTTCATCTTTACCA
CCATTGATAGCGTAAAGTAATGTTTTAGCTAAGTTCGCACGTGCACCGAAGAATTGCATT
TGTTTACCAATTGTCATCGCTGATACACAACATGCGATACCATAGTCATCGCCATAGCTT
TCACGCATAATGTCATCATTTTCATATTGGATAGAACTTGTTTTAATACTCATTTTTGCA
CAGTATGTTTTGAAGTTGTCAGGTA
LOCUS 21 (G3)
CTGAATAAAAACGCAACAAATAGTGCAAATGCTATCCCTGTGATAGCGAATAAAATATTC
ATGTATCATCACCTACAATAATTTATTAACAGCGACAGCAATTTTAGCACCCAACGCCGC
ATTGTTTTCAACAAGTTTTATATTTGCTGCTAAACTTTTACCATTCGTTTTTTCTACAAT
TTTCCCTAACAAGAACGGTGTGGCGTCCTTACCTTTAATACCTTGATTTTCCGCTTCAAC
AACAGCTTCATTTATGATTGCCTCAATATATGCTTTTGATAAGGCATGCTCATATGGAAT
TGGATTAGCAACAACAATGCCACCTTCAAGATTTAACTGCTGTTTTGTTAAATGAATGTC
AGCAAGTCGTTCTGGCGTTTCAACCGAACTTGTTAACTTAACACCGCTTTCGCGAGTGAA
GAATGCTGGCAATTCATTCGTTTGATATCCAATAACTGGAACGCCTTTTGTTTCTAAATA
CTCCATCGTCTTAGGTAAGTCTAAAATTGATTTGGCACCTGCACAGATAACAGTGACATT
TGTTTTAGACAGTTCTTCTAAGTCTGCTGAAATGTCCATCGTATGTTCTGCACCTTTATG
GACGCCCCCAATACCTCCTGTAACAAAAAATTGAATACCAGCCATTGCAGCACATATCAT
CGTCGTCGCTACAGTAGTAGCACCAACACACTTCATCGCAATAACTTCTGCTAAATCCCT

TCTAGATACTTTAGCAACGTCTTTACTAGTTGCCAGTATTTCTAAATCTTCGCTTTCTAA
ACCAATTTTAATTTTGCCATCTATAATGGCTATGGTTGCTGGAATGGCACCATTATTCCT
GATAATTTGCTCTACTGTTGTTGCCATTTCAACATTTTGTGGGTACGGCATACCATGCGA
AATAATTGTTGATTCTAATGCTACAATCGGTTGATTGTTCTCCCGTGCTTGCTGAACTTC
TCGAGAATACTCAATATACTTTTGTAAATTTGCCATTTTTATAATCCTCCATATCGTGAT
AAAGTTGCTGTTGATCTAGGTTTTGCCTAACTGTATATTTCGTTTCTATCGTTTTCTTTG
CGTTAACCATACCAGCAATTAATATATCTTCAGTAGACATCCCATTTAACCAGCTATACA
CTACTGCAGCACAGAATGAATCGCCTGCACCTGTAACATCTTTCACACTATTTGATGGCA
TAACTGACTTAATGATTTCTTCCTCACCACTTCGATAAATGAGTTCTTTCACGCCATTTG
TCACAATAACATTTTTAACACCTAAATCATTCCAGCGTTTAGCAGCTATTTTTAAATCAT
CAGTAGATTCTATTTTTAAATTTAAGTATGTTTCTGTTTCATCTTTATTCGTGATAATCC
AATCAATAGCATGTAATGAATCAGGCATATTTTTCATTTTTGGGGAAGAAACCGTGGTGA
TAACTAATTTGATTTGATGTTTCGTGGTATAGGCACATAAGAAGTTTAATGCCTCTTTGC
CTAAATTCAAATCTACAATAATGCACTTAGCCTTTTTCAATAAGTGTGAACGCTTAATTA
AAAATTCAGGCGTAATGTAGTCAAACACTTCCATATCTGCTAAGCCATATGTCATGTCGC
CTTCTTTACTAATTAAAGCTGTATATGAACCTGTACTCGCATTTTCAAATTGTTGAACAT
GATCCAAA
LOCUS 22 (I19)
GATCCATTGGCCTTTTACCAATTGAAACATCGCCAGACAAAACACTTTCAATACCTAAAC
CACTTAACAAACCTGCCAATAATCGTGTTGTCGTACCAGAATTACCTGTATACAATACTT
GATGTGGCGTGTTAAAAGATTGATATCCTGGGGAAGTCACAACTAATTTTTCATCATCTT
CTTTGATTTCTACACCTAACAGTCGGAAAATGTCCATCGTACGACGACAATCTTCGCCAA
GTAGTGGCTTATATATAGTAGATACACCTTCAGCTAGCGACGCCAACATGATTGCACGGT
GTGTCATTGACTTATCGCCCGGCACTTCTATTTCGCCCTTTAACGGACCTGAAATATCAA
TGATTTGTTCATTTACCATTTCATTCACCTACTTAAAATATGTTTTTAATTGTTCACATG
CATGTTGTAATGTTAGTTGATCAACATGTTGTACAACGATATCTCCAAATTGTCTAATCA
AGACCATTTGTACACCTTGCTTATCATTCTTTTTATCACTTAGCATATATTGGTATAACG
TTTCAAAATCCAAGTCAGTTATCATGTCTAAAGGATAGCCGAGTTGTATTAAATATTGAA
TATAATGATTAATATCATGCTTAGAATCAAACAAAGCATTCGCAACTATAAATTGATAGA
TAATGCCAACCATCACTGCATGACCATGAGGTATTTTATGATAGTATTCAACAGCATGAC
CAAATGTATGACCTAAATTTAAAAATTTACGTACACCTTGTTCTTTTTCATCTGCAATAA
CAATATCCAGCTTCGTTTCAATACCTTTAGCAATATATTTATCCATACCATTTAATGACT
GTAATATCTCTCTATCTTTAAAGTGCTGTTCGATATCTTGCGTCGCTGATTCACCATTCA
ATAACGCATGCTTATAAACTTCTGCATAGCCACTTAATATTTGCTCAAATGGTAACGTCT
TTAAAAAGACTAAATCATAAATCACAGCAGTTGGACGATAAAATGCACCGATAAGGTTTT
TACCTTGCTTTGAGTTAATACCCACTTTACCGCCAACACTAGAATCATGCGCTAGTATAG
TCGTTGGCACTTGTATAAAGTGCACGCCTCGTAAAAGTGTCGCCGCAATAAACCCAGCAA
AATCACCAGTTGCACCACCACCAACAGCAATAATTGCTGTATTACGAGTTACATGATGGG
ATAAAATATACTCTAATGTTTCTTGATATTGCTCAAATGTTTTCGTCTTTTCACCAGCTG
GAATAATAACTTTATGTACATTTTCATATGATAAAATATCATCAAATTTATCAGCAAAAT
ATTGATTTACATGCTCGTCAATTAATATAAAACTTTGATCAAACTGATCAATATACGTGC
TAATATGGTCAATTGCACCGTGTTCAACATATATTGGATAATTATTTGAAGGGTATGTTG
TTTGTAATTTCATGATTACACCTCAATTGTTCTTGTTGTTAAAACTCAATATTTAATTGT
CTGCGCTCAATAATTTGTTGTTTAAGTTGCTCAATATGATTTGATTGGAATTCTTCCAAT
AATGCTTTTGCTATTTCAAATGCTACGACATGTTCGCAGACGATACTTGCTGCAGGAACA
GCACAACTATCAGAACGTTCAATTGTTGCTTTAAAGTCTTCTTTAGTATTAATGTCTACT
GAATTTAATGGTTTATATAACGTTGGAATTGGTTTCATTACACCATTAACGATAATTGGC
ATTCCATTTGACATACCGCCTTCTAAACCACCTAAGTGATTAGATCCACGATAATAACCA
ATTTCACTATTATATAGAATTTCATCTTGAATCTCACTACCTGGCTTTTCAGCTGCTTTA
AATCCTTCACCAAAGCTTACACCTTTAAAAGCATTTATGCTGACAACACCTTGTGCAATC
TTACCATCTAACTTACGATCATAATGCACATAACTACCTACACCAACAGGCATATTTTCA

ACTACAACTTGAACGACACCGCCAATTGAATCTCCTTCATTTTTAGCTTCGTCAATTTTA
TCTCGCATTGCTTGTGCGATACTGTCATCAATTACACGAACATCATTACGATCAAGATTT
GCTTTAAATGTTTCTGAATCATAAAAATCTT
LOCUS 24(L10)
GATCGACCAATTCAAGTGGGCTCACATTTTCATTTTTATGAAGCAAATGCAGCATTAGAT
TTCGAACGTGAAATGGCATATGGAAAACATTTAGATATTCCAGCTGGAGCAGCTGTTCGA
TTTGAACCTGGGGATAAAAAAGAAGTTCAATTAGTTGAATATGCTGGCAAACGTAAAATT
TTTGGTTTTCGTGGTATGGTCAATGGTCCTATCGATGAGTCACGTGTCTATCGCCCAACT
GATGAAAATGATGAATATGCAGGTGTATTCGGAGATAACGGTGCTGAAAACGTGAATAAA
AAAGGAGGAAAAAGATCATGAGCTTTAAAATGACGCAAAATCAATATACGAGCTTATACG
GTCCAACTGTTGGAGATTCCATTCGTTTAGGTGATACGAATCTATTTGCTCAAATAGAAA
AAGACTATGCGGTTTATGGTGAAGAAGCTACTTTTGGTGGTGGTAAATCTATTAGAGACG
GTATGGCGCAAAATCCTCGTGTAACACGTGATGACGTGAACGTTGCAGACCTTGTCATTT
CTAATGCCGTTATTATCGATTACGATAAAGTGGTTAAAGCTGATATAGGCATTAAAAATG
GTTATATTTTCGCCATAGGTAATGCCGGCAACCCAGATATAATGGATAATGTCGACATTA
TTATAGGTTCAACAACAGATATCATTGCCGCTGAAGGTAAAATCGTCACTGCTGGTGGTA
TTGATACTCATGTTCATTTTATTAATCCTGAACAAGCAGAGGTCGCATTAGAAAGTGGTA
TTACGACTCATATTGGTGGTGGTACTGGTGCTTCAGAAGGTTCTAAAGCAACAACTGTAA
CTCCAGGTCCATGGCATATTCATAGAATGTTAGAAGCTGCCGAAGGTTTACCGATTAATG
TCGGTTTTACAGGTAAAGGACAAGCAACAAATCCAACTGCACTCATTGAACAAATCAATG
CCGGAGCAATTGGATTAAAAGTACATGAAGACTGGGGTGCAACACCATCTGCTTTGAGTC
ATGCATTAGATGTTGCTGATGAATTTGATGTTCAAATTGCATTACATGCAGATACTTTAA
ATGAAGCAGGATTTATGGAAGACACAATGGCTGCTGTTAAAGACCGTGTACTTCATATGT
ACCATACTGAAGGTGCTGGTGGCGGTCATGCGCCTGATTTAATTAAATCCGCTGCATTTT
CAAATATTTTACCTTCATCTACAAATCCAACTTTGCCTTATACACATAATACTGTAGATG
AACATTTAGATATGGTAATGATTACTCACCATTTAAATGCGGCTATTCCTGAAGATATCG
CATTCGCAGATTCACGTATTCGTAAAGAAACGATTGCAGCAGAAGATGTTCTGCAAGATA
TGGGTGTATTCAGTATGATTAGTTCCGATTCACAAGCAATGGGCCGTGTAGGTGAAGTAA
TTACACGAACATGGCAAGTAGCACATCGCATGAAAGAACAACGTGGTCCTTTAGATGGTG
ATTTTGAACATAATGATAATAATCGCATCAAACGTTATATCGCTAAATATACAATTAACC
CAGCAATTACACATGGTATTTCTGAATATGTAGGATCTATCGAGCCGGGCAA
LOCUS25(HA4)
GATCAGCATGCTACGGTGAATACGTTCCCGGGTCTTGTACACACCGCCCGTCACACCACG
AGAGTTTGTAACACCCGAAGCCGGTGGAGTAACCTTTTAGGAGCTAGCCGTCGAAGGTGG
GACAAATGATTGGGGTGAAGTCGTAACAAGGTAGCCGTATCGGAAGGTGCGGCTGGATCA
CCTCCTTTCTAAGGATATATTCGGAACATCTTCTTCAGAAGATGCGGAATAACGTGACAT
ATTGTATTCAGTTTTGAATGTTTATTTAACATTCAAATATTTTTTGGTTAAAGTGATATT
GCTTATGCGAGCGCTTGACAATCTATTCTTTTTAAAGAAAGCGGTTGTTAGACAATGCAT
TAAGAAAAATTAAAGCGGAGTTTACTTTTGTAAATGAGCATTTGATTTTTTGAAAATAAA
GCAGTATGCGAGCGCTTGACTAAAAAGAAATTGTACATTGAAAACTAGATAAGTAAGTAA
AATATAGATTTTACCAAGCAAAACCGAGTGAATAAAGAGTTTTAAATAAGCTTGAATTCA
TAAGAAATAATCGCTAGTGTTCGAAAGAACACTCACAAGATTAATAACGCGTTTAAATCT
TTTTATAAAAGAAAACGTTTAGCAGACAATGAGTTAAATTATTTTAAAGCAGAGTTTACT
TATGTAAATGAGCATTTAAAATAATGAAAACGAAGCCGTATGTGAGCGTTTGACTTATAA
AAATGGTGGAAACATAGATTAAGTTATTAAGGGCGCACGGTGGATGCCTTGGCACTAGAA
GCCGATGAAGGACGTTACTAACGACGATATGCTTTGGGGAGCTGTAAGTAAGCTTTGATC
CAGAGATTTCCGAATGGGGAAACCCAGCATGAGTTATGTCATGTTATCGATATGTGAATA
CATAGCATATCAGAAGGCACACCCGGAGAACTGAAACATCTTAGTACCCGGAGGAAGAGA
AAGAAAATTCGATTCCCTTAGTAGCGGCGAGCGAAACGGGAAGAGCCCAAACCAACAAGC

TTGCTTGTTGGGGTTGTAGGACACTCTATACGGAGTTACAAAGGACGACATTAGACGAAT
CATCTGGAAAGATGAATCAAAGAAGGTAATAATCCTGTAGTCGAAAATGTTGTCTCTCTT
GAGTGGATCCTGAGTACGACGGAGCACGTGAAATTCCGTCGGAATCTGGGAGGACCATCT
CCTAAGGCTAAATACTTTCTAGTGACCGATAGTGAACCACCACCGGGAGGGAAAGGGGAA
AAGCCCCCCGGGAGGGGAGGGAAATAAAACCTGAAACCGGGTGCTTACAAGTAGTCAAAA
CCCCTTTATGGGTGATGGCGCGCCTTTTGTAAAAAGAACCCGGGAGCTACCATTTGATGG
CAGGGTAAACAATACATGTGGAGCCCTACCGAAAGGCACCCTGAATAGGGGGTTTATTAT
TTGGGCCGCGACCCCCAAACCCGTTGTGCTCCCCTTGGGCCCGCTGTGACTTTTTGCCAC
TCCTCTGTGTGGGAGCGTCCCCCCGTCACCCCCGGGCCGCCCGGCGCAGCCCCGCCGGGC
GCCCCGACCACCCCATAACTAGCTGANNNNNNNNNNTCAGCTAGTTATTTGTTTTAGCCT
TGCTGGCCTGCAGGTCGGACTCTAAAGCACCCCAAAGCTACCCGGGGAAACAGGCTTATC
TCCCCCAAAATTCACATCGACGGGGAGGTTTGGCACCTCGATGTCGGCTCATCGCATCCT
GGGGCTGTAGTCGGTCCCAAGGGTTGGGCTGTTCGCCCATTAAAGCGGGACGCGAGCTGG
GTTCAAAACGTGGTGAGACAGTTCGGTCCCTATCCGTCGTGGGCGTAGGAAATTTGAGAG
GAGCTGTCCTTAGTACGAGAGGACCGGGATGGACATACCTCTGGTGTACCAGTTGTCGTG
CCAACGGCATAGCTGGGTAGCTATGTGTGGACGGGATAAGTGCTGAAAGCATCTAAGCAT
GAAGCCCCCCTCAAGATGAGATTTCCCAACTTCGGTTATAAGATCCCTCAAAGATGATGA
GGTTAATAGGTTCGAGGTGGAAGCATGGTGACATGTGGAGCTGACGAATACTAATCGATC
GAAGACTTAATCAAAATAAATGTTTTGCGAAGCAAAATCACTTTTACTTACTATCTAGTT
TTGAATGTATAAATTACATTCATATGTCTGGTGACTATAGCAAGGAGGTCACACCTGTTC
CCATGCCGAACACAGAAGTTAAGCTCCTTAGCGTCGATGGTAGTCGAACTTACGTTCCGC
TAGAGTAGAACGTTGCCAGGCAGTTTTAAATCGGAGAATTAGCTCAGCTGGGAGAGCATC
TGCCTTACAAGCAGAGGGTCGGCGGTTCGAACCCGTCATTCTCCACCATTTATTCTTACA
TATTGCCGGCCTAGCTCAATTGGTAGAGCAACTGACTTGTAATCAGTAGGTTGGGGGTTC
AAGTCCTCTGGCCGGCACCATGGAAGAGCCATTAGCTCAGTTGGTAGAGCATCTGACTTT
TAATCAGAGGGTCAGAGGTTCGAATCCTCTATGGCTCACCATTTGCGGGTGTGGCGGAAT
TGGCAGACGCACTAGACTTAGGATCTAGCGCCTTACGGCGTGGGGGTTCGACTCCCTTCA
CCCGCATATGCAGAAGTAGTTCAGCGGTAGAATACAACCTTGCCAAGGTTGGGGTCGCGG
GTTCGAATCCCGTCTTCTGCTCCATTTTTATAGTGCCGGGGTGGCGGAACTGGCAGACGC
ACAGGACTTAAAATCCTGCGGTGAGTGATCACCGTACCGGTTCGATTCCGGTCCTCGGCA
CCATTTTCAATAAAAACATATGCGCCCGTAGCTCAATTGGATAGAGCGTTTGACTACGGA
TCAAGAGGTTATGGGTTCGACTCCTATCGGGCGCGTTAATTATACGGGAAGTAGCTCAGC
TTGGTAGAGCACTTGGTTTGGGACCAAGGGGTCGCAGGTTCGAATCCTGTCTTCCCGATA
TACTGTAATTATTATGGGGGCTTAGCTCAGCTGGGAGAGCGCCTGCTTTGCACGCAGGAG
GTCAGCGGTTCGATCCCGCTAGTCTCCACCATATTATTTACAAACTATATAAGGCGGTGT
AGCTCAGCTGGCTAGAGCGTACGGTTCATACCCGTGAGGTCGGGGGTTCGATCCCCTCCA
CCGCCACTATTTATTAGTTGTAAAATTATATTTAGGACCTTTAGCTCAGTTGGTTAGAGC
TAACGGCTCATAACCGTTCGGTCGCAGGTTCGAGTCCTGCAAGGTCCATATAATTTTGGA
GGAATACCCAAGTCCGGCTGAAGGGATCGGTCTTGAAAACCGACAGGGGCTTAACGGCTC
GCGGGGGTTCGAATCCCTCTTCCTCCGTTTTACTAATGGTCTCGTAGTGTAGCGGTTAAC
ACGCCTGCCTGTCACGCAGGAGATCGCGGGTTCGATTCCCGTCGAGACCGCCATTTAATT
TTATAATTAATAGCGATTTACCTATAATAATGGAGGAATACCCAAGTCCGGCTGAAGGGA
TCGGTCTTGAAAACCGACAGGGCCTTAACGGGCCGCGGGGGTTCGAATCCCTCTTCCTCC
GCCATTATTTTTTATTATCGCGGGATGGAGCAGTTCGGTAGCTCGTCGGGCTCATAACCC
GAAGGTCGGTGGTTCAAATCCGCCTCCCGCAATATTTTATAGGTCTCGTAGTGTAGCGGT
TAACACGCCTGCCTGTCACGCAGGAGATCGCGGGTTCGATTCCCGTCGAGACCGCCATCA
TTACATTTTTATTATGGTTCAGTAGCTCAGTTGGTAGAGCAATGGATTGAAGCTCCATGT
GTCGGCAGTTCGACTCTGTCCTGAACCATTTCTTAGCCGGCCTAGCTCAATTGGTAGAGC
AACTGACTTGTAATCAGTAGGTTGGGGGTTCAAGTCCTCTGGCCGGCACCATTTATGGAG
GGGTAGCGAAGTGGCTAAACGCGGCGGACTGTAAATCCGCTCCTTCGGGTTCGGCAGTTC
GAATCTGCCCCCCTCCATTTATTATTTTTAATAGGGGCATAGTTCAACGGTAGAATAGAG
GTCTCCAAAACCTTTGGTGTGGGTTCGATTCCTACTGCCCCTGCCATGGCGGCTGTGGTG
AAGTGGTTAACACATCGGATTGTGGTTCCGACATTCGAGGGTTCGATCCCCTTCAGCCGC
CCTTATTATTAATGGGCTATAGCCAAGCGGTAAGGCAACGGACTTTGACTCCGTCACTCG

TTGGTTCGAATCCAGCTAGCCCAGTTATTGGCGGCATAGCCAAGTGGTAAGGCAGAGGTC
TGCAAAACCTTTATCACCGGTTCAAATCCGGTTGCCGCCTCCAGGTTTATGCGGGAGTAG
TTCAACTTTTAGAACACGTTCCTTCCCGGAACGAGGTATAGGTGCAAATCCTATCTTCCG
CTCCATAATTTAATAATAATGCGGGAGTATTTCAACTCTTAGAATACATTCCTTCCTGGA
ATGAGGTATAGGTGTAAATCCTATCTTCCGCTCCATAATTTAATATTTGCGGGAGTAGTT
CAACTTTTAGAACACGTTCCTTCCCGGAACGAGGTATAGGTGTAAATCCTATCTTCCGCT
CCATAATTGCTTCCAAAGGGAAGTTTTTTGTTTACCATTAAGCCGGTGTGGCGGAATTGG
CAGACGCGCGGGACTCAAAATCCCGTTCCACTTGTGGAGTGTCGGTTCGACCCCGACCAC
CGGTATAATTAACTGTTATTTACATAACATAACGTATTAGAAACCTTGTAAAACAAGGTT
TCTTTTTATTTCTCTCTATACAATACAAATAAAAGTGGACTCAAATGGCACACGCTTTAA
TAGACTCTATGTCAAATTGTAATGATGAGTTCAATATTGGAAGTTAAGCAACTATGCATT
GTTTAACGGTTCTCCACCAAATGTGGTGGGTATATAATTTAAAGAACTATTTTTAAAATA
CAACTTTTAGAGTTTTTATTATTAGGCGGCCAGTCCATTATTGGGCTTGGTTGTCTTCTT
TTTTTCTCCTTTGTACAAGCTGAAAATCATCATTATACGTGCTTTAAAGTTGTTGAAATT
TCTGTAACCAAAAGAAATTCACTTGATTAATTTTATCTTATTATTAATTCCTTCTATAGC
ACCATTATTAAATGCTGGGTAATAAATTGTATTTCTTAACATCCTTTGATGTTTTCTATA
ATATTTAACCACTTTCCATACACCCTTACTCACAGACTTTTTACTAACTGAATTTAAACG
ATTAATAAATTTAGGCCAATTACATAACCTTAGGTCTTTTCGTAATCCTTGGACAAGTTC
GTAGGAGTGTCGTAGTATATCGTCTTTTGAAAGCATGAATTCTACAATGTCAGATGAGCG
TTTATAAGCCTTAAAAGATTTATTCCATCTGTATTTACTAAAGATGGTTTTACTAGTATC
CATCAATAGGACTTTCCAGTTATTCTTAAAAATTGAATAATCAGGTCCTTTTTTTATTACG
GTATTCATTCATAACTTGGACACGATACTTATTAAGGTCCTCTATTTAAATGTTGAACGA
TATGGAATCCGCTAACTAGCTGANNNNNNNNNNTCAGCTAGTTACTCTCCCCAATAATCA
TCCTTGAGGGAGCCCTAAAGCTATTTGGAGAGACCCAGCATCTCAGGTTCGATTGGATTT
CTCCCTCCCCTCAGTTCATCCGCTCACTTTTCAACGTAAGTCGGTTCGGTCCCCCATTCA
GTGTTACCTGAACTTCAACCTGCCCAAGGGTAGATCCCCTGGTTTCGGGTGTACGACCAA
ATAATAAACGCCCTATTCAGACTCGCTTTCGTTACGGCTCCACATTTACTGCTTAACCTT
GCATCAAATCGTAACTCGCCGGTTCATTCTACAAAAGGCACGCCATCACCCATTAACGGG
CTCTGACTACTTGTAAGCACACGGTTTCAGGTTCTATTTCACTCCCCTTCCGGGGTGCTT
TTCACCTTTCCCTCACGGTACTGGTTCACTATCGGTCACTAGAGAGTATTTAGCCTTAGG
AGATGGTCCTCCCAGATTCCGACGGAATTTCACGTGCTCCGTCGTACTCAGGATCCACTC
AAGAGAGACAACATTTTCGACTACAGGATTATTACCTTCTTTGATTCATCTTTCCAGATG
ATTCGTCTAATGTCGTCCTTTGTAACTCCGTATAGAGTGTCCTACAACCCCAACAAGCAA
GCTTGTTGGTTTGGGCTCTTCCCGTTTCGCTCGCCGCTACTAAGGGAATCGAATTTTCTT
TCTCTTCCTCCGGGTACTAAGATGTTTCAGTTCTCCGGGTGTGCCTTCTGATATGCTATG
TATTCACATATCGATAACATGACATAACTCATGCTGGGTTTCCCCATTCGGAAATCTCTG
G
LOCUS 26 (L19):
GATCGCTAGTACTTCTTCAGGTGATGAAGCATGTAATAATTTCTCACGTACATTTTCATC
CATTAAAATACCAGACAACTTAGCTAAAGCATCTAGATGTGTTTGGGCGCCACCTTCTGG
CGCTGCAATCATAAAGAATAAGTGTGCTGGTTGCATATCCAAACTTTGATAATCTACGCC
TGCTTTAGATTTACCAAACGCAATAGCTGGTGACTTAACTGCGGCCACTTTGGCATGTGG
AATGGCAATACCTTCGCCGATACCAGTTGTACTTTGTGATTCTCGATTGTGAATCGCTTC
CTTAAATGACGCGACATCACTTAATTTACCTGCTTTGTCTAATTGATTTACTAACTCATC
AATAACACCATTTTTGTCATTTGCCATTAAATCCATTGCTATTGTATCTTTTGTTAATAA
CTCTGTTACTCTCATTATTTTCACTCCCCATCAAGTACGCTAATCGTAACTTGTGATTTT
ATTTTTTCTATAGCGTCCCGTGTTGCTAAGTCCTCATCAAATGCCGTGGCAGTACCGCAT
GCGACTGCTTGTTGGAATGCTTTTTCAATCGTTAAACCTGAAGCAATTCCAGCCACCATG
CCTGCAACTGTACTATCACCAGAGCCAACTGTATTAACCACTTTCCCTTGTGGATTAACT
GCTTTAATACTGATTTCTTTATCAATATAAATAGCACCATCACCGCCAAGCGAGACAATA
ACAGATTGCGCACCTTTATCAACTAACAAACGACCATATTTAATAACATCTGTGTCTGAG
TTCACTGTTGTATTAAACATCACTTCTAATTCATCTTTATTAGGTTTAATAAATAGTGGA

TGATATGGTAAAACGCTTTCAGCCAATTCTTTTTCAGCGTCGACTACTAATTTAGCACCT
GTCTGTGCTGTAATTTGTGCAATTTGCGCATACGCATCGCTTGGAATACTACTTGGTACA
CTTCCAGCAACAATAACTATATCTTCGCTTGTTGTATTTTTAATTTGTTGTAACAGTTGT
TCAAATTGTGTTGACGTTATATGAGGACCCGGTGCATTGATTTCTGTTTCTTGTCCTGTT
TTTAATTTCACATTAATACGTGTATCTTCATCAACTTCAATAAAATTCGATTGAATTGCA
CTGTTATTTAATGTATCTATAATGAATTTCCCAGGAAATCCACCTGCAAATCCCAAGGCA
GTTGACTCAACATCCAATGTCTTTAAGACGCGCGAGACATTAATACCTTTCCCCCCAGCG
AATTTATATGTTGCTGTTGCTCTGTTCAAACCATCAATTTTAAAATCATTCGTAAAAATG
ACATAGTCAATTGAAGGATTGAAAGTCACTGTATAAATCATAAAGTCCCTCCTATAAAGT
GATACTTTTGTTGGTATTCTTTTAACGATTCTTGATTTAATGCTTTTTCAGATGTGATGA
TTGTCGTACTTTCTAGCAAAGGTACACGAGCAAAATATACTTTATTAAACTTAGAATGAT
CTATAAGTACAAATGATTGATTGGCTAATGACATTGCTGTTTGTTTAACTAATGCCTCTT
GCTCATCGGGAGTAGTTAATCCAAGTTCAATATCTAATCCATTCATCCCGATAAAAGCTT
TATCGAAACAATATCGTCTTAATATCTCCATAGCACTAGAACCAATCGTAGCAAGTGTAT
TTTCTTTAACTTGACCACCTAGCATAATTGTTTTAATACCTTTTTTTAAGTAAAGCTTCTA
CATGTGTTAAACCATTGGTTACCACAATGATATCTTTCGCTTGAATATATTTAATTAGCT
CCAATGTAGATGAACCAGCATCGATAAATAAGCATTCATTATCGTTGATTTGATTAGCTG
CTATTTTAGCAATCATTTTCTTTTCATCAAGATTCGTTGCTAATTTTTCAGTTAAATTCG
CCTCAACCATACGATTTTCTTTTAACATTGCACCACCATGCACACGTTGCAATTTCCCTA
ATTGTTGTAGTTTAGATAAATCTCTTCGTATTGTTGAAGCACTGCAACCAGTTCGATC
LOCUS 27A(A2)
GGATCTCCTGTATTGAATTCTAAACATGAACTGATTGGTATTTTATATGCAGGTAGTGGA
AAAGATGAATCTGAAAAGAATTTCGGTGTTTATTTCACACCACAATTAAAAGAATTTATT
CAAAATAATATTGAAAAATAAGTATCATCAATTCATTCGTGAAGTTGATTTTTTAAAGAG
TGATTAAGAAAACGGTTACATAATTAACTAAATATACTGAATTATGTATCTAGATATCAA
AATAATTAAAAGAGAGGAACTTAAAATGAACAAAAACGTAGTCATCAAGAGTTTAGCAGC
ATTAACAATTTTAACATCTGTAACAGGTATTGGAACAACATTGGTTGAGGAAGTACAACA
AACTGCCAAAGCAGAAAATAATGTCACAAAAGTTAAAGATACTAATATTTTTCCATATAC
LOCUS 27B(A5)
GAAAAATAAGTATCATCAATTCATTCGTGAAGTTGATTTTTTAAAGAGTGATTAAGAAAA
CGGTTACATAATTAACTAAATATACTGAATTATGTATCTAGATATCAAAATAATTAAAAG
AGAGGAACTTAAAATGAACAAAAACGTAGTCATCAAGAGTTTAGCAGCATTAACAATTTT
AACATCTGTAACAGGTATTGGAACAACATTGGTTGAGGAAGTACAACAAACTGCCAAAGC
AGAAAATAATGTCACAAAAGTTAAAGATACTAATATTTTTCCATATACTGGTGTAGTTGC
TTTTAAAAGTGCAACTGGATTTGTAGTTGGAAAGAATACTATTTTAACAAATAAACATGT
GTCGAAAAATTACAAAGTGGGCGATCGTATTACTGCACATCCAAATAGTGATAAAGGTAA
TGGTGGTATTTATTCGATTAAAAAGATTATTAATTATCCAGGTAAAGAAGATGTATCAGT
CATTCAAGTTGAAGAGCGTGCAATAGAACGTGGACCAAAAGGCTTTAATTTTAATGATAA
TGTAACGCCATTCAAATATGCGGCAGGGGCTAAAGCTGGTGAGCGAATTAAAGTGATTGG
TTATCCACACCCATACAAAAATAAATATGTTTTATATGAGTCAACTGGCCCTGTGATGTC
AGTAGAAGGTAGCAGTATTGTATATTCAGCGCATACTGAAAGCGGAAACTCTGGATCACC
TGTATTAAACAGCAACAACGAATTAGTTGGTATTCATTTTGCTTCTGATGTAAAAAATGA
TGATAACAGAAATGCATATGGCGTCTACTTTACACCAGAAATTAAAAAATTCATTGCAGA
AAACATAGATAAATAAACAAATTGACTTTAAACGAGCGTTGCAACATATCTCGAATTGTA
AAGGAGCTTGAAAATGAATAAAAATATAGTCATTAAAAGCATGGCAGCATTAGCCATTCT
AACCTCAGTAACTGGAATAAATGCTGCAGTCGTTGAAGAGACACAACAAATAGCAAATGC
AGAGAAGAATGTTACGCAAGTTAAAGATACAAATATTTTTCCATATAATGGCGTCGTTTC
ATTTAAAGATGCGACAGGTTTTGTAATTGGAAAAAATACAATTATCACCAATAAACATGT
ATCAAAAGATTATAAAGTTGGCGATAGAATTACTGCCCATCCAAACGGTGACAAAGGAAA
TGGTGGTATATATAAAATTAAAAGCATTTCTGATTATCCGGGTGATGAAGACATCTCTGT

CATGAATATTGAAGAACAAGCAGTCGAACGTGGACCAAAAGGCTTTAATTTTAATGAAAA
TGTCCAAGCATTCAATTTTGCGAAAGATGCTAAAGTTGATGACAAAATTAAAGTTATTGG
TTACCCATTACCTGCTCAAAATAGTTTTAAACAGTTTGAATCTACAGGAACTATAAAAAG
AATCAAAGACAATATTTTAAATTTTGATGCATACATTGAACCCGGGAATTCAGGATCACC
AGTTCTAAATTCTAACAATGAGGTCATAGGTGTGGTGTATGGCGGTATTGGAAAAATTGG
TTCTGAATATAATGGTGCCGTATACTTTACGCCTCAAATCAAAGATTTTATTCAAAAGCA
CATTGAACAATAAACAAATTTAAATATACACCATGAGCATGTGTTCAATAATTTTAATGA
AAAACATCGGTCGAATATAACATAAAAAAACGTCTATATCAAAAGCATCATGAATAAACA
GAGGAGCACAAAAATGAATAAAAATATAATCATCAAAAGTATTGCGGCATTGACGATTTT
AACATCAATAACTGGTGTCGGCACAACAGTGGTTGATGGTATTCAACAAACAGCCAAAGC
AGAAAATAGTGTGAAATTAATTACCAACACGAATGTTGCACCATACAGTGGTGTTACATG
GATGGGCGCTGGAACAGGATTTGTAGTTGGGAATCATACAATCATTACCAATAAACATGT
TACTTATCACATGAAAGTCGGTGATGAAATCAAAGCACATCCTAATGGTTTTTATAATAA
CGGTGGTGGACTTTATAAAGTTACTAAGATTGTAGATTATCCTGGTAAAGAAGATATTGC
GGTCGTACAAGTTGAAGAAAAATCAACGCAACCAAAAGGTAGAAAATTCAAAGATTTCAC
TAGCAAATTTAATATAGCATCAGAAGCTAAAGAAAATGAACCTATATCAGTCATTGGTTA
TCCAAATCCTAATGGAAATAAACTACAAATGTATGAATCAACTGGTAAAGTACTATCAGT
GAATGGAAATATAGTGACATCTGATGCGGTTGTCCAACCTGGCAGCTCTGGTTCACCTAT
ATTAAATAGTAAGCGAGAAGCAATTGGTGTTATGTATGCTAGTGATAAACCAACAGGTGA
AAGTACAAGGTCATTTGCTGTTTATTTCTCTCCTGAAATTAAGAAATTTATTGCAGATAA
TTTAGATAAATAAATCATCCATCCATACATTGATAAATGATTTTTAGAAATTAACAACAA
AATCAACAATTTTAAACATCTCTGTGATTCTATTTATTCGAAATGATTTAAAAAATAAAA
CTTCAAAAACCTAACCTTATATTTATACGAATACTTAGAGGAGCACAAAAATGAATAAAA
ATATAATCATCAAAAGTATTGCAGCATTGACGATTTTAACATCAGTGACTGGCGTCGGCA
CAACAGTGGTTGAGGGTATTCAACAAACGGCTAAAGCTGAACATAATGTGAAACTAATCA
AAAATACTAATGTAGCACCATACAATGGTGTCGTTTCGATAGGATC
LOCUS 27C(A7)
GGATCACCAGTTCTAAATTCTAACAATGAGGTCATAGGTGTGGTGTATGGCGGTATTGGA
AAAATTGGTTCTGAATATAATGGTGCCGTATACTTTACGCCTCAAATCAAAGATTTTATT
CAAAAGCACATTGAACAATAAACAAATTTAAATATACACCATGAGCATGTGTTCAATAAT
TTTAATGAAAAACATCGGTCGAATATAACATAAAAAAACGTCTATATCAAAAGCATCATG
AATAAACAGAGGAGCACAAAAATGAATAAAAATATAATCATCAAAAGTATTGCGGCATTG
ACGATTTTAACATCAATAACTGGTGTCGGCACAACAGTGGTTGATGGTATTCAACAAACA
GCCAAAGCAGAAAATAGTGTGAAATTAATTACCAACACGAATGTTGCACCATACAGTGGT
GTTACATGGATGGGCGCTGGAACAGGATTTGTAGTTGGGAATCATACAATCATTACCAAT
AAACATGTTACTTATCACATGAAAGTCGGTGATGAAATCAAAGCACATCCTAATGGTTTT
TATAATAACGGTGGTGGACTTTATAAAGTTACTAAGATTGTAGATTATCCTGGTAAAGAA
GATATTGCGGTCGTACAAGTTGAAGAAAAATCAACGCAACCAAAAGGTAGAAAATTCAAA
GATTTCACTAGCAAATTTAATATAGCATCAGAAGCTAAAGAAAATGAACCTATATCAGTC
ATTGGTTATCCAAATCCTAATGGAAATAAACTACAAATGTATGAATCAACTGGTAAAGTA
CTATCAGTGAATGGAAATATAGTGACATCTGATGCGGTTGTCCAACCTGGCAGCTCTGGT
TCACCTATATTAAATAGTAAGCGAGAAGCAATTGGTGTTATGTATGCTAGTGATAAACCA
ACAGGTGAAAGTACAAGGTCATTTGCTGTTTATTTCTCTCCTGAAATTAAGAAATTTATT
GCAGATAATTTAGATAAATAAATCATCCATCCATACATTGATAAATGATTTTTAGAAATT
AACAACAAAATCAACAATTTTAAACATCTCTGTGATTCTATTTATTCGAAATGATTTAAA
AAATAAAACTTCAAAAACCTAACCTTATATTTATACGAATACTTAGAGGAGCACAAAAAT
GAATAAAAATATAATCATCAAAAGTATTGCAGCATTGACGATTTTAACATCAGTGACTGG
CGTCGGCACAACAGTGGTTGAGGGTATTCAACAAACGGCTAAAGCTGAACATAATGTGAA
ACTAATCAAAAATACTAATGTAGCACCATACAATGGTGTCGTTTCGATAGGATCTGGAAC
AGGTTTCATTGTCGGTAAAAATACAATTGTTACCAACAAGCATGTCGTTGCAGGTATGGA
AATTGGTGCACATATTATAGCGCATCCCAATGGTGAATATAATAATGGCGGATTTTATAA
AGTTAAAAAAATTGTCCGTTATTCAGGTCAAGAAGATATTGCCATTCTACATGTGGAAGA

TAAAGCTGTTCATCCAAAAAACAGGAATTTTAAAGATTACACAGGCATTTTAAAAATAGC
ATCAGAAGCTAAAGAAAATGAACGCATTTCAATTGTTGGCTATCCAGAACCATATATAAA
TAAATTTCAAATGTATGAGTCAACAGGAAAAGTGCTGTCAGTTAAAGGCAACATGATTAT
TACTGATGCTTTCGTAGAACCAGGCAACTCAGGTTCAGCTGTATTTAACAGTAAATACGA
AGTTGTAGGTGTTCACTTTGGTGGAAACGGCCCTGGAAATAAAAGTACAAAAGGATATGG
TGTTTATTTCTCTCCTGAAATTAAGAAATTCATTGCAGATAACACAGATAAATAAATCCT
TACATAGATAAATGATTTTAAAAATTAACAACAAACTCAACAATTCAAATCATCTCTGTG
ATTCCATTTATTCGAAATGATTAAAAAAAATAAAACTTCAAAAAGCTAACATTATAATTA
TACAAATACTTAGAGGAGCAGAAAAATGAATAAAAATATAATCATCAAAAGTATTGCAGC
ATTGACGATTTTAACATCAATAACTGGTGTCGGCACAACAATGGTTGAAGGTATTCAACA
AACAGCCAAAGCCGAAAATACTGTTAAACAAATTACAAATACAAATGTTGCACCATACAG
TGGTGTTACATGGATGGGCGCTGGAACAGGATTTGTAGTTGGAAATCATACAATCATTAC
CAATAAACATGTTACCTATCACATGAAAGTCGGTGATGAAATCAAAGCACATCCTAATGG
TTTTTATAATAACGGTGGTGGACTTTATAAAGTTACTAAGATTGTAGATTATCCTGGTAA
AGAAGATATTGCGGTTGTACAAGTTGAAGAAAAATCAACACAACCAAAAGGTAGAAAATT
CAAAGATTTCACTAGTAAATTTAATATAGCATCAGAAGCTAAAGAAAATGAACCTATATC
AGTCATTGGTTATCCAAATCCTAATGGAAATAAACTACAAATGTATGAATCAACTGGTAA
AGTATTATCAGTGAATGGGAATATAGTGTCATCGGATGCAATTATTCAGCCTGGTAGCTC
TGGTTCACCTATATTAAATAGTAAACACGAAGCTATTGGTGTAATCTATGCCGGTAATAA
GCCATCAGGTGAAAGCACAAGAGGATTTGCTGTTTATTTCTCTCCTGAAATTAAGAAATT
CATTGCAGATAATTTAGATAAATAATTAAAACTTAGACATTCACCCAATCCTGACAAAAT
ATACTATAACTAACATTTATTAATATATATTGCATTATTTAATATGCATCAAAGCCAATC
AACGATTGATTTTCACCAACTCAATTGTTGATTGGTTTTATTTATGTATGAATGAACAAC
TTTTTGACATCATTAAGAATATAAATGATTTTGAAAGCATTTGAAAGCTACAACATTTCT
ATAAAATTTTTCAATAACAATTGCGCCACTAAAACTCAAAATTTCCACCACCAACATCCA
AATTATCAACATCGCAACATAACCAAATGTTATAATAAATCTATTACACAAAGAGATAAA
TTACTTATGCAAAGGCGGAGGAATCACATGTCTATTACTGAAAAACAACGTCAGCAACAA
GCTGAATTACATAAAAAATTATGGTCGATTGCGAATGATTTAAGAGGGAACATGGATGCG
AGTGAATTCCGTAATTACATTTTAGGCTTGATTTTCTATCGCTTCTTATCTGAAAAAGCC
GAACAAGAATATGCAGATGCCTTGTCAGGTGAAGACATCACGTATCAAGAAGCATGGGCA
GATGAAGAATATCGTGAAGACTTAAAAGCAGAATTAATTGATC
LOCUS 27D(AF7)
GATCTGGAACAGGTTTCATTGTCGGTAAAAAT
ACAATTGTTACCAACAAGCATGTCGTTGCAGGTATGGAAATTGGTGCACATATTATAGCG
CATCCCAATGGTGAATATAATAATGGCGGATTTTATAAAGTTAAAAAAATTGTCCGTTAT
TCAGGTCAAGAAGATATTGCCATTCTACATGTGGAAGATAAAGCTGTTCATCCAAAAAAC
AGGAATTTTAAAGATTACACAGGCATTTTAAAAATAGCATCAGAAGCTAAAGAAAATGAA
CGCATTTCAATTGTTGGCTATCCAGAACCATATATAAATAAATTTCAAATGTATGAGTCA
ACAGGAAAAGTGCTGTCAGTTAAAGGCAACATGATTATTACTGATGCTTTCGTAGAACCA
GGCAACTCAGGTTCAGCTGTATTTAACAGTAAATACGAAGTTGTAGGTGTTCACTTTGGT
GGAAACGGCCCTGGAAATAAAAGTACAAAAGGATATGGTGTTTATTTCTCTCCTGAAATT
AAGAAATTCATTGCAGATAACACAGATAAATAAATCCTTACATAGATAAATGATTTTAAA
AATTAACAACAAACTCAACAATTCAAATCATCTCTGTGATTCCATTTATTCGAAATGATT
AAAAAAAATAAAACTTCAAAAAGCTAACATTATAATTATACAAATACTTAGAGGAGCAGA
AAAATGAATAAAAATATAATCATCAAAAGTATTGCAGCATTGACGATTTTAACATCAATA
ACTGGTGTCGGCACAACAATGGTTGAAGGTATTCAACAAACAGCCAAAGCCGAAAATACT
GTTAAACAAATTACAAATACAAATGTTGCACCATACAGTGGTGTTACATGGATGGGCGCT
GGAACAGGATTTGTAGTTGGAAATCATACAATCATTACCAATAAACATGTTACCTATCAC
ATGAAAGTCGGTGATGAAATCAAAGCACATCCTAATGGTTTTTATAATAACGGTGGTGGA
CTTTATAAAGTTACTAAGATTGTAGATTATCCTGGTAAAGAAGATATTGCGGTTGTACAA
GTTGAAGAAAAATCAACACAACCAAAAGGTAGAAAATTCAAAGATTTCACTAGTAAATTT
AATATAGCATCAGAAGCTAAAGAAAATGAACCTATATCAGTCATTGGTTATCCAAATCCT

AATGGAAATAAACTACAAATGTATGAATCAACTGGTAAAGTATTATCAGTGAATGGGAAT
ATAGTGTCTTCGGATGCAATTATTCAGCCTGGTAGCTCTGGTTCACCTATATTAAATAGT
AAACACGAAGCTATTGGTGTAATCTATGCCGGTAATAAGCCATCAGGTGAAAGCACAAGA
GGATTTGCTGTTTATTTCTCTCCTGAAATTAAGAAATTCATTGCAGATAATTTAGATAAA
TAATTAAAACTTAGACATTCACCCAATCCTGACAAAATATACTATAACTAACATTTATTA
ATATATATTGCATTATTTAATATGCATCAAAGCCAATCAACGATTGATTTTCACCAACTC
AATTGTTGATTGGTTTTATTTATGTATGAATGAACAACTTTTTGACATCATTAAGAATAT
AAATGATTTTGAAAGCATTTGAAAGCTACAACATTTCTATAAAATTTTTCAATAACAATT
GCGCCACTAAAACTCAAAATTTCCACCACCAACATCCAAATTATCAACATCGCAACATAA
CCAAATGTTATAATAAATCTATTACACAAAGAGATAAATTACTTATGCAAAGGCGGAGGA
ATCACATGTCTATTACTGAAAAACAACGTCAGCAACAAGCTGAATTACATAAAAAATTAT
GGTCGATTGCGAATGATTTAAGAGGGAACATGGATGCGAGTGAATTCCGTAATTACATTT
TAGGCTTGATTTTCTATCGCTTCTTATCTGAAAAAGCCGAACAAGAATATGCAGATGCCT
TGTCAGGTGAAGACATCACGTATCAAGAAGCATGGGCAGATGAAGAATATCGTGAAGACT
TAAAAGCAGAATTAATTGATC
LOCUS 28(H130)
AAATATTCGACAACATCGTCTGGTAGACAGTCAGGACGCGTACCAATAGATAATCCCACA
ACACCCGGTTCTTTAAGTACAGGTTCGAATTTTTCTTTTAATACTTCAACCGGTGCATGT
GTATTTGTAAATGCCTGAAAATAAGCAATATATTTTCCTTCGTGCCATTTCTCATGCATC
TTTTCTTTAATTTCTTTAAATTGTACTGCGATTGAATCTGCACGATTACCTGCAAAGTCT
CCGCTACCTGCAGCAGAACAAAATGTACATCCACCATGTGCTACAGTGCCATCGCGGTTA
GGACAGTCAAACCCGCCATCCAATGCAACTTTAAATATTTTTTGTCCAAATTTATTTTTT
AAATGGTAATTCCATGTGTGATAACGTTTGTTTTCAAAAGCGTATTGGAAATGATTGCCC
ATATGTCATTTTCCTTTCTATAAAAAAAGAGTTCTAAGTACAGATTTTAACATATTTTAA
TGTTATAGTGTTTATTATAGTTTGACAAAAAAGAGAGGAACTATGAAATATGAATATA
CCTAAATCAGTCTGGTGGCTAGTAATTGGCATGGCGTTAAATATTACTGGTTCCAGTTTT
TTGTGGCCTTTAAATACAATTTATATGAAACAAGAACTTGGAAAAAGTTTAACTGTTGCT
GGTTTAGTGCTAATGATAAATTCATTTGGCATGGTTATTGGAAACTTATTAGGTGGTTCA
CTATTTGATAAATTAGGTGGATACAAGACGATTTTAATTGGAACTTTCACTTGTCTTTGT
AGTACAACGCTACTTAATTTCTTTCACGGGTGGCCTTGGTATGCTGTATGGCTTGTAATG
TTAGGGTTTGGTGGCGGAATGATTATTCCTGCGATATACGCTATGGCTGGAGCAGTGTGG
CCAAATGGCGGAAGACAAACGTTTAATGCGATATACTTAGCGCAAAATATTGGTGTGGCT
GTCGGTGCTGCAATGGGCGGCTTTGTCGCAGAATTTAGCTTTAACTATATCTTTTTAGCC
AATCTTATTATGTATGTTGTGTTTGCGCTTGTCGCGGTAACGCAATTTAATATTGAAATT
AATGCGAAAGTTAAATATCCAACTCATTTAGATATTACTGGTAAAAAGAATAAAGCAAGA
TTTATTTCATTAGTACTAATTTGTGCAATGTTTGCAATTTGTTGGGTTGCATATATTCAA
TGGGAGTCTACAATCGCTTCATTTACACAATCTATTAATATTTCAATGGCACAATATAGT
GTTTTATGGACAATTAACGGAATAATGATTTTAGTAGCACAACCATTAATTAAACCGATT
CTCTATCTGTTAAAAGGAAACTTAAAGAAGCAAATGTTTGTCGGCATCATCATTTTTATG
TTGTCGTTCTTTGTCACGAGTTTTGCCGAAAACTTTACAATATTTGTTGTCGGTATGATT
ATTTTAACTTTTGGAGAAATGTTTGTATGGCCAGCAGTTCCAACTATAGCCAATCAGTTA
GCGCCAGATGGTAAGCAAGGACAGTACCAAGGTTTTGTGAATTCAGCTGCTACAGTAGGA
AAAGCATTTGGTCCATTTCTTGGTGGTGTATTAGTTGATGCGTTTAATATGCGCATGATG
TTTATCGGTATGATGCTACTACTTGTATTTGCATTAATATTATTAATGGTTTTCAAGGAG
AATAATACGCAACCTAAAAAAATAGATGCATAATGAGTAAATAGAATTAACGTTATAGAC
TTGAAATAAATGTCGTTATAACATAATATTAATTTGTATAATTTAATTTCGTTTGGAGCT
TTTCTACAGAAAGCTAGTGATGCTGAGAGCTAGTGTTAAGGACTAAATGTAAATCGTATT
AATTTTAAATTGAATGAATGACATCTCTTACTATTAAAATGAGTGCACAATTTTTGTGAA
ATAGGGTGGTAACGCGGCAAATGTCGTCCCTATGTAAATAGAATAGTTAGAGGTGTCTTT
TTTATTGAATAGGAGGAAATGTGTTGAATTACAACCACAATCAAATTGAAAAGAAATGGC
AAGACTATTGGGACGAAAATAAAACATTTAAAACAAATGATAACTTAGGTCAAAAGAAAT

TTTATGCTTTAGACATGTTTCCATATCCATCAGGTGCTGGTTTACATGTTGGACATCCTG
AGGGCTATACAGCAACAGATATCATTTCAAGATATAAAAGAATGCAAGGATATAATGTAT
TACATCCGATGGGGTGGGATGCATTCGGATTACCAGCAGAGCAATATGCTTTAGACACTG
GCAACGACCCACGTGAATTTACAAAGAAAAATATCCAAACTTTTAAACGACAAATTAAAG
AATTAGGGTTCAGTTATGATTGGGATCGTGAAGTTAATACAACA

LOCUS 29(A)N10

GATCTTGCTTGCGTTTTCTAAACAATAGTAATGATCCTAATAATGCCATCATTGCACCAA
ATAAAGTTGCATTTGTGTTTTCGCTCTTATCTCCTGTTTCTGGTAAAGCATCAGTTTTGT
GTTGTTTTGATACCTTATTAGAATGGTTTACTTCACCTTTAGGATTTGATGGTGCTTTCT
GTTCATTATTTGGTGGTGTAACTCTTGAATCGGAGTCACTATCTGAGTCTGAGTCGCTAT
CTGAATCCGAGTCGCTATCCGAGTCTGAGTCGCTATCTGAGTCTGAATCGCTGTCTGAGT
CTGAGTCGCTATCCGAGTCTGAGTCGCTGTCTGAATCTGAATCACTGTCTGAATCCGAAT
CGCTATCTGAATCTGAATCGCTATCCGAGTCTGAGTCGCTGTCTGAATCTGAATCGCTGT
CTGAGTCCGAATCGCTATCTGAATCTGAGTCGCTGTCTGAGTCTGAATCGCTATCTGAAT
CTGAGTCGCTATCTGAGTCTGAGTCGCTGTCTGAGTCTGAGTCGCTGTCTGAGTCTGAAT
CGCTATCTGAATCTGAGTCGCTGTCTGAGTCTGAGTCGCTATCTGAGTCTGAGTCGCTGT
CTGAATCTGAGTCGCTGTCTGAATCTGAATCGCTGTCTGAGTCTGAATCGCTATCTGAGT
CTGAATCGCTATCTGAGTCTGAATCACTGTCTGAGTCCGAGTCACTGTCTGAATCTGACT
CACTATCTGATTCTGAGTCGCTATCTGATTCTGAGTCGCTGTCTGAATCTGAATCACTGT
CTGAATCCGAATCGCTATCTGATTCTGAGTCGCTATCTGAACCTGAGTCGCTGTCTGAGC
CTGAGTCACTGTCTGAATCCGAATCCGGATCCGGGTCTGGGCTTGGTTCCGGTTCTGGGT
CTGGACTTGGTTCTGGATCTGGCGTTGGTTCTGGTTCTGGGTCTGGACTTGGTTCTGGGT
CAACCGGCGGCCCTGGAGTTGGGTCTTTCGGATTTACTGCTGAATCACCATCAGCACTTC
CACCACCATAACGTACAACATTCTCATTATTCCAACCGAAAATACTGTAGTCTCTATTTG
TTACAGGATCAACATTTTCTTGAATAACCTGAGTTTTTAAGTTCTTACCTGTATTGTCGT
AATGCCCTTCTACTAATACTACATATGTTTTAGTAATATCACCAAATTTAATACTAGCTA
CATTTGGATGCTCATAATAGATTCTATTTTTAAATTGGTCTGTTACTTCTTTAAGGTTAG
AGTCATTTGGATCTGCATAGTAGCTATCTGATAATTTAGATGTATCATTCACTTCAAAAA
TTCTCAGTTTTGTATCTGTAGCACTTACTTTACCGCTACTTTCTTCGATTTTATCTTGGT
AGCCTTTAATATACACCCACGTATTACCTAAAACTCGTTGCTTAGGGTTAACAAATACTG
TTTGCTTGTATGTGTTTTGACCTGAAGCTGTATCTACACCAATAATTTGAGAAGAAATGT
TCGCGCCATTTGGTTTATCAATTCCTGCAATTGGCGAACTATAGTTATAAGTAATTTTAT
TATTAAACATTTCATCCGCAATATTAATATTCGCATCATATGTTCCTGATTTAGGTGCCT
TTGCTCGGTCTGTAAATAAAGGTAATGAAAATTGTCCGTTAATATTTTCTTTATTATTTA
CATAATCTGTAAAGACAAATGTATACGTCTTAGTCAAGATATCATATGTTGCTTTAGCTA
CAACATCGCCATTCGTACTTTTAATGTCTGCAATTGGCATCGTATTATTTGAATTAGAAT
AATCCACGTCTCCATTACCAGTTAAACTATCTGGTAACTTCGCTGTAAAATAATCCCCTG
ATTTCACTTTATCTGTCACTGTAAAATTTGCCGCCATAAATGTGTTACCACTTTGATTAG
GGTCAAATGTAGTCTTTTCTAACTTGAAATTACTTGCCGTAACTTTATCATTTACATTTG
TACCTTTAGCATCAGCAGCATTTACTACCGGTTCAGCAACAGCTAAACTACGTACAGCTC
TCGTTCTAACACTTGGTTTACTAGTTCCTTGCGCATTGGAAATCGTTTGTGGTGATGATT
GTGGTAAATCTAATGTTTGAGAATTTTTAAGCTCACTGTTTGTTGCTATGCTATTAGCAT
CATTCGTTGTTTTATTATCTACTTGAGAATTTGCTTCTTGAGGAACAGTTTGATCTTGCA
TTTTTGCAGCAGTTGCTTGATTTTTAATTGCCGTCGGTTGAGGTGTTTCATTTGTTGAAG
CTGGCTCTGTTGTAGTGGTATTGCTCGTTTGTGTAGACATTGGTTTTGTTGTGCTATCTA
CATTCGCACTGTTTGTGTTTGCACTAATATCAGATGTATCATTAGCCGTTGTATTTAATT
GAGGTGTTTCTATCATATTGTTTTTTTCGGAATCTGCACTTGCATTATTTTTCGAAGATT
GCGTTGTATCGTTCGATTGTTCTGAAGCTTGTGCTTGATGATTGCCTATCCCAAATAGTA
TAGTTGCCCCTACTATTACTGATGTGGTACCTACTGTAAAACGTCTAATCGAATACTTAT
TCTGCTTATTCGACAAATAATCAATTCTTTTTTTCAAAAATATTACTCCATTTCAATTTC
TAGATTAGTCTAAATTGTATAATGAAATAAGAATTATATCAATTGCTTTTCGAAAAAAAT

TACGTAAAATTTGTTTTCTTCCTATTTATATAACTTAAAATTTTCTGTTAACTAGCAAAA
ATCAATATACTATTTTTACACTATTACAAATTTTTTACTTTTCAAAAACTTAGAAGTTCT
AAATTTTTCATCACCTTAAATTTTACTGTAATTTCAACAATCAAATTTAACTAACATTTT
AAATTATTCATCATGCTAGCAAAAAAGGCCTAACGTATAAATGTACGTTAGACCTCATGT
TCAACTTATTCATTTTACATTGTATATTAAACACATACATCATTGAATAAATGTTTGCTT
ACTAACC
LOCUS 29(B)GE2
GATCCACATTGGGCATAATCACAGCTAATTTGTGTTCATTCGCATACCTTTCTATGCTTG
TATATCTCATATATGTCGTTTCATCACTTGATAATCCATGTAACAACATTAAAGTTTTTA
ATGGTTTAACAGTTGTATCGCTATTAAAGAAGCTTTGATCTTCCGGTAAAATGACTGTCA
AATTTTGATGCATACCAATTGTTGGTGAATGATAGTTTAATGAAATATAAGCCATACGTC
ATGACCCCTTTCTAATTCTACTTTATCAACATTTTACGCTTAATCAATTCACTTTAAAAT
CATTTTCAACAAAAAAACCGAATACAAATGTATTCGGCCTAAAAAAGTATTTACGCTTTT
TCTTTATGATCTTGCTTGCGTTTTCTAAACAATAGTAATGATCCTAATAATGCCATCATT
GCACCAAATAAAGTTGCATTTGTGTTTTCGCTCTTATCTCCTGTTTCTGGTAAAGCATCA
GTTTTGTGTTGTTTTGATACCTTATTAGAATGGTTTACTTCACCTTTAGGATTTGATGGT
GCTTTCTGTTCATTATTTGGTGGTGTAACTCTTGAATCGGAGTCACTATCTGAGTCTGAG
TCGCTATCTGAATCCGAGTCGCTATCCGAGTCTGAGTCGCTATCTGAGTCTGAATCGCTG
TCTGAGTCTGAGTCGCTATCCGAGTCTGAGTCGCTGTCTGAATCTGAATCACTGTCTGAA
TCCGAATCGCTATCTGAATCTGAATCGCTATCCGAGTCTGAGTCGCTGTCTGAATCTGAA
TCGCTGTCTGAGTCCGAATCGCTATCTGAATCTGAGTCGCTGTCTGAGTCTGAATCGCTA
TCTGAATCTGAGTCGCTATCTGAGTCTGAGTCGCTGTCTGAGTCTGAGTCGCTGTCTGAG
TCTGAATCGCTATCTGAATCTGAGTCGCTGTCTGAGTCTGAGTCGCTATCTGAGTCTGAG
TCGCTGTCTGAATCTGAGTCGCTGTCTGAATCTGAATCGCTGTCTGAGTCTGAATCGCTA
TCTGAGTCTGAATCGCTATCTGAGTCTGAATCACTGTCTGAGTCCGAGTCACTGTCTGAA
TCTGACTCACTATCTGATTCTGAGTCGCTATCTGATTCTGAGTCGCTGTCTGAATCTGAA
TCACTGTCTGAATCCGAATCGCTATCTGATTCTGAGTCGCTATCTGAACCTGAGTCGCTG
TCTGAGCCTGAGTCACTGTCTGAATCCGAATCCGGATCCGGGTCTGGGCTTGGTTCCGGT
TCTGGGTCTGGACTTGGTTCTGGATCTGGCGTTGGTTCTGGTTCTGGGTCTGGACTTGGT
TCTGGGTCAACCGGCGGCCCTGGAGTTGGGTCTTTCGGATTTACTGCTGAATCACCATCA
GCACTTCCACCACCATAACGTACAACATTCTCATTATTCCAACCGAAAATACTGTAGTCT
CTATTTGTTACAGGATCAACATTTTCTTGAATAACCTGAGTTTTTAAGTTCTTACCTGTA
TTGTCGTAATGCCCTTCTACTAATACTACATATGTTTTAGTAATATCACCAAATTTAATA
CTAGCTACATTTGGATGCTCATAATAGATTCTATTTTTAAATTGGTCTGTTACTTCTTTA
AGGTTAGAGTCATTTGGATCTGCATAGTAGCTATCTGATAATTTAGATGTATCATTCACT
TCAAAAATTCTCAGTTTTGTATCTGTAGCACTTACTTTACCGCTACTTTCTTCGATTTTA
TCTTGGTAGCCTTTAATATACACCCACGTATTACCTAAAACTCGTTGCTTAGGGTTAACA
AATACTGTTTGCTTGTATGTGTTTTGACCTGAAGCTGTATCTACACCAATAATTTGAGAA
GAAATGTTCGCGCCATTTGGTTTATCAATTCCTGCAATTGGCGAACTATAGTTATAAGTA
ATTTTATTATTAAACATTTCATCCGCAATATTAATATTCGCATCATATGTTCCTGATTTA
GGTGCCTTTGCTCGGTCTGTAAATAAAGGTAATGAAAATTGTCCGTTAATATTTTCTTTA
TTATTTACATAATCTGTAAAGACAAATGTATACGTCTTAGTCAAGATATCATATGTTGCT
TTAGCTACAACATCGCCATTCGTACTTTTAATGTCTGCAATTGGCATCGTATTATTTGAA
TTAGAATAATCCACGTCTCCATTACCAGTTAAACTATCTGGTAACTTCGCTGTAAAATAA
TCCCCTGATTTCACTTTATCTGTCACTGTAAAATTTGCCGCCATAAATGTGTTACCACTT
TGATTAGGGTCAAATGTAGTCTTTTCTAACTTGAAATTACTTGCCGTAACTTTATCATTT
ACATTTGTACCTTTAGCATCAGCAGCATTTACTACCGGTTCAGCAACAGCTAAACTACGT
ACAGCTCTCGTTCTAACACTTGGTTTACTAGTTCCTTGCGCATTGGAAATCGTTTGTGGT
GATGATTGTGGTAAATCTAATGTTTGAGAATTTTTAAGCTCACTGTTTGTTGCTATGCTA
TTAGCATCATTCGTTGTTTTATTATCTACTTGAGAATTTGCTTCTTGAGGAACAGTTTGA
TC

LOCUS 30 (N15)
GATCCATTTGTCCCTACCGCTCGTCTTACATCAAGTTTACCTTGCTCATTTAATGGAAAA
TGAGTTTGTGGATGGTCTACATAAGCACGCACCTCGCCTTTAGCATTTGCATCGGCAATA
ATTCGTCCAATAGGTCCTTGGCCATCTACAGTGACAGTTAATTTTTGATCACCTTTCAAC
ATTGCGCCCATCATAGCTGTTGCTGTCATTGTTCTTCCCATTGCAGCAGATGCTGTCGGC
CATGTATAATGTCTCGTTTGTGCTTCTTGAACAGTTTCAGTTGTCAAAGCAGCATAAGCC
CTAATCTCTCCATCAAATGCTAATGCTTTAACAATATAATCGTGTGTCATTATTTCAATC
TCCTCTATTACTCTATATTTAAAAAATTACTTTACTTCATAAAATGCAACAATTGTACTT
ATTCTACACCCATCATTCTAAATAATGAAGTAACTTGTTTTACAATTATTTTCTGCTATA
ACAATTCAACGACTTAAAATCTAATACGTATTTTCAAAAACGATAAAAGTACCTCTTTCT
ATAACTTTATCATAGAAAGAGGTACTGAATATAATCGATTATTTATTGTCTGGGTGATTT
GGATCGTAAGGTTTTTCGATATTTGGGGCTTGTCGATGTGCTGGTTCATCTTTTTCATCA
GATTTATCAGCTTCTTTTTTATCCTCAGCAATATCTTTTTCTTCTTTACGATCTTCACTT
TCGTCACGTTGTCCATCTTCTAATTGCTCTTTACGAATCTCTTCATAAGATTTACCGAAT
TTACCATCATTAAATTCAGAATCTTCATCTTTAACAACTTTAGCTGCATCATAATCAATT
TCAGGTAATTTACCTTCGTAGAATAATGATTGAATTTGTTCAGCAACTAATGTTTCTTCT
GTTAATAATGTTTCAGCAATTAAAATTAATTGTTCTTTGTGCTCTAATAAAATTTGTTTA
CAACGTTCGTATTGTTCTTTAACGATTCGTTGAACTTCTTTATCAATTTCATATGCGATT
TGGCTTGAATAATTAGGCTCACCTTGCATATCTTTACCTAAGAATACTTGACCATTGCTA
TGACCGAACTGTAATGGTCCTAATTTTTTACTCATACCATATTGCGTAACCATTGAGCGT
GCGATTTGTGTTGCACGTTCGAAGTCATTTGAAGCACCTGTTGATACTTCGTTAAAGTTA
ATATCTTCTGATACACGTCCACCAAGTAAACCACAGATTTTATCTAATAACTCTTGTTCA
GTCATTA
LOCUS 31
ACGATGGTGTCTTGCAACATCGAAAATAATGTTGTGTAAGAACGTTGTTCTACCATATCC
TGGACTTCCGATTAACGCGATGTGCCCAGCTTTTTTCAATTGCAATACCATCGGTCCTTG
ATATTGTTCTTCTGGTACGTCTTTAAGTCCTAATGTTAATTCCACTTCTTTTGCATCATC
TGACCATAATTTTCTGAAATCTGTTTCTACTAAATCTTCTTGATATACATTTTCTGGCAA
TGGTGGTAGCCATGGACGCTTAACTTCTTCGATTTCTAATCGTGTTGTAATAGATTCGAT
ATGATCTATGACCGCTTCTAACTCAGTTTGATTTTCTTTCGTTTCTTCATCTTCAAGTCC
ACTCAAGTCTTTGTTGATTGCTTGAAGTTGACCATAGTCATTAATCATGTAAATCGTCTT
ATCTTCAACTTCTAATTTATCGCCTTCGATGTCATATGTTGCACCACTCCATGCAGATTG
GAATAATTCATAAATTTCATTATTACCAACTTGTAAATACGCACGACCTGGTAATGTAAT
GTCTGCTGCATCTGGTGTTTTTAAAATTTCATTACTGTCTTGTCTATCTTGTACTTTTAA
TGCCAACTTAAATTTAGAGTTAGACCAAATTTGGTCATCAACAACACCCGATGGTTTTTG
TGTCGCAAGTATTAAATGAATACCTAACGAACGTCCAATACGTGCCGTTGATACAAGTTC
TTTCATAAAATCAGGTTGTTCTGATTTTAATTCGGCAAACTCATCGGAAATAATGAATAA
ATGTGGCATTGGTTCTGTCGCAATACCTTCTTTAAATAACTTATGGTATTGATTAATATG
GTTAACATCATGCTCTCCGAATAAACGTTGACGTTTTCTCAATTCGGCTTTGATTGATGT
TAAGGCACGCATCGCTTCATCGCCATCTAAGTTTGTAATCGTACCAACTAAATGGACTAA
ATCTTTAAATAAGTTCGCCATACCCCCACCTTTATAGTCAATCAATAGGAATGCAACTTC
ATGAGGGTGAAAATTAATAGCTAAAGATAAAATGTATGATTGGATAATCTCAGATTTCCC
TGAACCAGTGGTACCAGCAACTAAACCATGTGGCCCGTGTGCTTTTTCATGTAAGTTCAA
TGATAAAATATCATCTTTACCTCTTACACCTAAAGGTACTGCCATCGTTTTGTATGTTTC
GTTTTGTCTCCATCGATTAACCACATCAAGCTGATC
LOCUS 32A(HE9)

GATCAGATAGATAAAGTATTTTCTTTTTATTATGTTTATCAGAATATGCGCCACCGAAAA
TACCAAATATAATAAATGGAAGTGTTTGACTCATAACCATCATTGATAATTTTAAAGATG
ATTGGTTTGTCAATTCAACAGTAAACCAAATTATTTGTAACGAAAACAGCACAAAACAAC
TCCGACGTAAGAAATTACCAATCAATAAATATGTAAAGTTTCTATTTTTCAAAACTTCTA
AATACAACATATTTATCACCTCTCATAAAAATAATTGAATGCATCCACCAGCTTTTTTAG
ACCTTCTTCTAAACTCTCTTTATCCAAAGCGCAATTAATTCTAATATAATTTAGTCAGTT
AAATATCAATTATTTCGAAATATACATACTACTTGAAACACCATACATAACCCCCAAAAT
GACTACTCAGAGGTTATATTCTACTAATTATGATTATATTAAATATGAAAATATTATCAA
AAAAATCAAATTTATAACAAAAATACACCCCTTAAAGTTAGGTCTTTCAATCCAACTTTT
GGGGTGTATATCATTCTCATCATATTCTAGGTTGTTTTTAACAAACTAAATATAGTGAAT
GCAAATCAACTATTATTTAAATTATGAATTATTTTAATTCTTTCTTCTACGAGCCAATAA
CATTAATCCAGCAATTCCAATTATACTACTAAAGATCAAACCTTTTTGCGTGCTTTCTAA
ACCTGTTTTTGGTAATTCTGCTCGTTTTTTCTCTTGATTAGCTACTGATTCTTTAGCAAT
TTTAGATTTTTTAACTTTATCATTTTTATCCATTGAATGAACTGGGCCATTTGGTTTTGC
TCTGTCTTTCGATAATCCTGGATTGTTAGGATTTACTGGGCCACTTGGATGAGTTGGTCT
GCTCGGCTTCTCTGGGTTTTCAGGTCCTTTTGGATCTTTTGGTTTCTCTCCACCGAACTC
TACAATCTTATCTACTGGTTGTTTTGTGATCTCTTCTGTTGGTTGACCCTCGCCAACTTT
TTCACCTGTTAATGGGTTCACTGTGATTGGTGTTGTGATTGTCTTACTTCCTGGTTGTCC
TTCTTGTTTCACTCGCTCTTCACCAGGTTGTAATTTTGGATTAAACTCACGTTTTGTTTC
AAACGGTATCTCTACTGTTTTTGTTTCTGGTGTACCCGTTTTTGGTCCGTGTTTAATCAC
ATCATCCACTGGCTCTTCGATCACTTTTCCTGTGTCTGGATTCTTGATTCCTGGTTTACC
TGGTACTTTTTCCGTTTGATCTGTTGGTAAGTTTGGATCAAAGATATCTTTATGACCTTG
CGGTATTTTCTCGCCACCGAATTCTGTTAATTCATTAACTGGATCTTTTGTGATTTCTTC
TTTCGATTCACCTTTACTAATAATTTCTCCAGTTAATGGATTTTTTAGTGTTGGCGTCGT
TATTGTCTTCTCACCTTTTTGTCCTTCTCTTGTTACTTTTTCTGTCCCTGGTGCTAAATC
AGGATTAAATTTACGTTCTTTCTCGAATGGAATTTCTTCTTTTTCTACAATCGAGTCTCC
TTTTACAGGTCCATATTTTGTTACGCTATCGACCGGTGGTCTAACTACATCTCCTGTTTC
TGGATTCTTAATTCCTGGTTTACCTGGAACTTCCTCTTTCTCTCCTGTTGGTAACTTCGG
ATCAAATTCGTCTCGATGACCTGGTGTTATCGTTTCTGGTCCGTATTCTGTTAATTCATT
AATCGGATCTTTTGTGATTTCTTCTTTCGATTCACCTTTACTAATAATTTCTCCAGTTAA
TGGATTTTTTAGTGTTGGCGTCGTTATTGTCTTCTCACCTTTTTGTCCTTCTCTTGTTAC
TTTTTCTGTCCCTGGTGCTAAATCAGGATTAAATTTACGTTCTTTCTCGAATGGAATTTC
TTCTTTTTCTACAATCGAGTCTCCTTTTACAGGTCCATATTTTGTTACGCTATCGACCGG
TGGTCTAACTACATCTCCTGTTTCTGGATTCTTAATTCCTGGTTTACCTGGAACTTCCTC
TTTCTCTCCTGTTGGTAACTTCGGATCAAATTCGTCTCGATGACCTGGTGTTATCGTTTC
TGGTCCGTATTCTGTTAATTCATTAATCGGATCTTTTGTGATTTCTTCTTTCGATTCACC
TTTACTAATAATTTCTCCAGTTAATGGATTTTTTAGTGTTGGCGTCGTTATTGTCTTCTC
ACCTTTTTGTCCTTCTCTTGTTACTTTTTCTGTCCCTGGTGCTAAATCAGGATTAAATTT
ACGTTCTTTCTTGAATGGAATTTCTTCTTTTTCTACAATCGAGTCTCCTTTTACAGGTCC
ATATTTTGTTACGCTATCGACCGGTGGTCTAACTACGTCTCCTGTTTCTGGATTCTTAAT
TCCTGGTTTACCTGGAACTTCCTCTTTCTCTCCTGTTGGTAACTTCGGATCAAATTCGTC
TCGATGACCTGGTGTTATCGTTTCTGGTCCGTATTCTGTTAATTCATTAATCGGATCTTT
TGTGATTTCTTCTTTCGATTCACCTTTACTAATAATTTCTCCAGTTAATGGATTTTTTAG
TGTTGGCGTCGTTATTGTCTTCTCACCTTTTTGTCCTTCTCTTGTTACTTTTTCTGTCCC
TGGTGCTAAATCAGGATTAAATTTACGTTCTTTCTCGAATGGAATCTCTTCTTTTTCTAC
AATCGAGTCTCCTTTTACAGGTCCATATTTTGTTACGCTATCGACCGGTGGTCTAACTAC
ATCTCCTGTTTCTGGATTCTTAATTCCTGGTTTACCTGGAACTTCCTCTTTCTCTCCTGT
TGGTAACTTCGGATCAAATTCGTCTCGATGACCTGGTGTTATCGTTTCTGGTCCGTATTC
TGTTAATTCATTAATCGGATC
LOCUS 32B (P9)

GATCAAATTCGTCTCGATGACCTGGTGTTATCGTTTCTGGTCCGTATTCTGTTAATTCAT
TAATCGGATCTTTTGTGATTTCTTCTTTCGATTCACCTTTACTAATAATTTCTCCAGTTA
ATGGATTTTTTAGTGTTGGCGTCGTTATTGTCTTCTCACCTTTTTGTCCTTCTCTTGTTA
CTTTTTCTGTCCCTGGTGCTAAATCAGGATTAAATTTACGTTCTTTCTTGAATGGAATTT
CTTCTTTTTCTACAATCGAGTCTCCTTTTACAGGTCCATATTTTGTTACGCTATCGACCG
GTGGTCTAACTACGTCTCCTGTTTCTGGATTCTTAATTCCTGGTTTACCTGGAACTTCCT
CTTTCTCTCCTGTTGGTAACTTCGGATCAAATTCGTCTCGATGACCTGGTGTTATCGTTT
CTGGTCCGTATTCTGTTAATTCATTAATCGGATCTTTTGTGATTTCTTCTTTCGATTCAC
CTTTACTAATAATTTCTCCAGTTAATGGATTTTTTAGTGTTGGCGTCGTTATTGTCTTCT
CACCTTTTTGTCCTTCTCTTGTTACTTTTTCTGTCCCTGGTGCTAAATCAGGATTAAATT
TACGTTCTTTCTCGAATGGAATCTCTTCTTTTTCTACAATCGAGTCTCCTTTTACAGGTC
CATATTTTGTTACGCTATCGACCGGTGGTCTAACTACATCTCCTGTTTCTGGATTCTTAA
TTCCTGGTTTACCTGGAACTTCCTCTTTCTCTCCTGTTGGTAACTTCGGATCAAATTCGT
CTCGATGACCTGGTGTTATCGTTTCTGGTCCGTATTCTGTTAATTCATTAATCGGATCTT
TTGTGATTTCTTCTTTCGATTCACCTTTACTAATAATTTCTCCAGTTAATGGATTTTTTA
GTGTTGGCGTCGTTATTGTCTTCTCACCTTTTTGTCCTTCTCTTGTTACTTTTTCTGTCC
CTGGTGCTAAATCCGGATTAAATTTACGTTCTTTCTTGAATGGAATCTCTTCTTTTTCTA
CAATCGAGTCTCCTTTTACAGGTCCATATTTTGTTACGCTATCGACCGGTGGTCTAACTA
CGTCTCCTGTTTCTGGATTCTTAATTCCTGGTTTACCTGGAACTTCTTCTTTCTCTCCTG
TTGGTAACTTCGGATCAAATTCGTCTCGATGACCTGGTGTTATCGTTTCTGGTCCGTATT
CTGTTAATTCATTAATCGGATCTTTTGTGATTTCTTCTTTTGGTTCACCTTTACTAATAA
TTACTCCAGTTAATGGATTTTTTAGTGTTGGTGTCGTTATTGTCTTCTCACCTTTTTGTC
CTTCTCTTGTTACTTTTTCTGTCCCTGGTGCTAAATCAGGATTAAATTTACGTTCTTTCT
CGAATGGAATCTCTTCTTTTTCTACAATCGAGTCTCCTTTTACAGGTCCATATTTTGTTA
CGCTATCGACCGGTGGTCTAACTACATCTCCTGTTTCTGGATTCTTAATTCCTGGTTTAC
CTGGAACTTCCTCTTTCTCTCCTGTTGGTAACTTCGGATC
LOCUS 33(O14)
GATCGATAAAATAGTTTATGCCTTGGGCGAAACCAGGTGAGGTTTTGACGATAATGTATG
AACCATTGATGATTGAACTTAGAACTTCATGTTCACAATAGTGTCTAAACTTTTCTCTCA
TCTCTTGTTCTGTTTGATTATTAATAGCTTTATAAATCCATGTCTCACAATCGATAGGGA
CACGATATATATTTAGTTCCTTCAAGTCTTTAGCAATTGTTGTTGCACTATATCTTACAC
CAAAATATTCTTCAATATATGAAATGATTTGTTCTTTTTTATAAATCTTATGCTTTTTAA
CTATTGTAGAAACAATTTCTAATCGTTTACTTTTCTTCATATTGTAAACTCCTTTGGTAG
TTACGTTTCTTGTATTAAAAAATAAATTCATGCATGTTTCATTTATAATTTAACACTTTG
TTTTGCAAAAGATAATAAAAATACATGTAAATTTTTTGTGACAACTTTTAAAATGAATTT
TGTATTCTAAGTCAGCATTTAATTATCACATATCTACTACTTGTAATGATTTTAGACTGC
CGAGTAGTCTTTCGGCAGACAACCCTCACACTCCTCTCATCTAATTACAAAGAGAGGGTA
TACCTACAAAGTCAATTATCAATGTAGGTATACCCCATATATAAGCTGTATTTAAAATTT
AATTATTTATAAGTGTTTAACATTACTTCTTCTTGTTTATATATTTTTACTCCACGCCTA
CTTCATTCCATGCTTCATACACCTGTTCAGCTGTTTGCTCGTCATATAAATCTTTAGCCG
CTTGGTATAATGCATCTTTACAATCTTTGAAGTTTGAATTACTTGTTAAGTATTCCGTTA
ATGCTCGGTAGTAAATTTGTTCTGATTTAGATTTCCCTATTGCTTGAATCACGTTATAAG
CTGCTTTATTTGGAATTCCAGAATTCGTATGTACGCCACCATTATCTTTTTTCAGTGAATA
CATAGTCTTTCATATGAGCTGGTTGACCAAATTGTTCTGGGTTTGACATGCTGCGTAAAG
CGTCTCCCTCTTTTCCAGGTGTGTAGACATCTTCACCCATTAAGAAATCCTCGTCATCTA
CAAAGTATCCAAAAACATCTGAAAAGCTTTCATTTAGAGCGCCTGACTGGTCCTTATATT
CTAAGTTCGCTGTCTCTTGTGTCACACCGTGTGTTAATTCGTGTGCTACTACGTCATTTG
CACCCGATAAACTTGTGAATGTGCGACCATCACCATCACCATAGATCATTTTGTCACCGA
TCCATGCGGCATTATTTCTGTTATCTTGACCACCGTAGTTATTAACATGCGTTAATGAAA
CAATTGGACTACCTTGGTTGTCATATGATTCACGACCAAATGTGTCTTTGTAATAATCAT

ATGTTTGTTTAGCGTAATAATTTGCATCTACGCCAGCACGTTGCTCATCTTTTACGAAGT
TTTCATCTTCATTAGTAATCAATGTTGCTTG
LOCUS 34 (O18)
GATCCTTTGTCACTACCTGAAGCAGAATTTTTATCATCTTTACCTGGTGCATTAGCACCT
GCTACATCAGTTGGTCCATTAAATTTATATGTAATGTTGTAATGATGGTCATATTTGAAT
GGCTTTCCATTTACTTTTTCATCGATATAAACGTCAATTTTTCCATCTATTTTACCGTTC
AACTTACTTACTTCAAATTCAGAAGTGCGTTCATCTTTGGCAGTGTTTTTACTAATAATA
TTTTCTTTATGTCCTTCGATACTCATTCCAGTAATCCAATGACTGTGGTTGACAGTTATT
TGAACATACAATTTACCATTTTTCTTAATGTACTTTGCCGGTTTATTAAAATAGTCATTA
GCAATTGACGTGTCATTGGTATTGTATTTGTAAACCTCATAATTCAAAGTACCGCTATCT
GCGGCATTTGCAGAATTACTGAATGTCGCGATGATGATAATTAACGCTAAAATCGTTGTA
TTAAAAACTTTTAAAATATTTTTCAAAACATAATCCTCCTTTTTATGATTGCTTTTAAGT
CTTTAGTAAAATCATAAATAATAATGATTATCATTGTCAATATTTATTTTATAATCAATT
TATTATTGTTATACGAAAATAGATGTGCTAGTATAATTGATAACCATTATCAATTGCAAT
GGTTAATCATCTCATATAACAACACATAATTTGTATCCTTAGGAGGAAAACAACATGACA
AAACATTATTTAAACAGTAAGTATCAATCAGAACAACGTTCATCAGCTATGAAAAAGATT
ACAATGGGTACAGCATCTATCATTTTAGGTTCCCTTGTATACATAGGCGCAGACAGCCAA
CAAGTCAATGCGGCAACAGAAGCTACGAACGCAACTAATAATCAAAGCACACAAGTTTCT
CAAGCAACATCACAACCAATTAATTTCCAAGTGCAAAAAGATGGCTCTTCAGAGAAGTCA
CACATGGATGACTATATGCAACACCCTGGTAAAGTAATTAAACAAAATAATAAATATTAT
TTCCAAACCGTGTTAAACAATGCATCATTCTGGAAAGAATACAAATTTTACAATGCAAAC
AATCAAGAATTAGCAACAACTGTTGTTAACGATAATAAAAAAGCGGATACTAGAACAATC
AATGTTGCAGTTGAACCTGGATATAAGAGCTTAACTACTAAAGTACATATTGTCGTGCCA
CAAATTAATTACAATCATAGATATACTACGCATTTGGAATTTGAAAAAGCAATTCCTACA
TTAGCTGACGCAGCAAAACCAAACAATGTTAAACCGGTTCAACCAAAACCAGCTCAACCT
AAAACACCTACTGAGCAAACTAAACCAGTTCAACCTAAAGTTGAAAAAGTTAAACCTACT
GTAACTACAACAAGCAAAGTTGAAGACAATCACTCTACTAAAGTTGTAAGTACTGACAC
LOCUS 35A(P13)
GATCAATACTATTTTCACCTGTCGTTTTCGCTTGGTCTACATCATTTTGACTATTAGCAG
CTTCAATGTTGCTATTTGCTTGTGTCACAGCATTATCTACGTCCGCATTAGCCGCTGCAA
TTTCTTCAGCAGTAATGTCTTGCGTTTGAGCGATTGCTGTTTTACGTTCATTCGCTTTCG
TAGCAATTGCTTCTTTCGCATTATCTTTAGTTGTTGTTGCTGGCTGAATCGCTTCAATTT
TAGCAATTGCTGCTTTTTTAGCCGCTTCAACTTCCGCATTTGTATGTGCTGCATCTATTG
CGGCATCAGCTGTTGTTTTTTCAGTTTGAACTTGTTGTTTAGCAGCTGCTTTTTCTTCAG
TTGTTGAGCCGTTATTTCCATCAATTGCTGTTTCTTGAGCTTGTACTTTATCTGCAATTG
CTTGTTTTGCTGCTGGTTTAACATTTGCATCAGGTGTAATGGCTGCGATTGTAGCTTCAT
TTGTAGTTTTTGCATTATCCACATCATTGTTTGCTGCAGCATTATCTATATCAGCGTTTG
CAGTAACTACTGCTTGATCCACTTTGTCTTTCGCTGCTTGTTGTTCTTCAGTAGTCGAAT
CATTCATTGCTTCAATTGCTGTTTTACGTTCACTTGCTTTTTGAGCGATTTCCGCTTTTG
CATCCGATTTCTTAGTTGTGGCAGCTTGAACTTGATTAATTGCAGCAATACTATTGTCTT
TAGCTGTTGTTACATCACTGTTTGTATTTGCAGCATCAAGATTTGTTCTTGCTTCTTGCT
TTTTAGTATCTAATTCTGTATATGCAGCTTGTTTTTCTTCTGTAGTTGAAGCATTGCTAT
TTTGAATTTCTTGTTTACGTGTATTATATGCGTTTTCTACTTCCGTATCAGCTGCAGGTT
TAACTTTTGCTTGTGTTTGAATTGCATTGATTTTATCTAATACTTTTGATTTTGTATCAG
CAACTTCCTGTTTTGATTTAACAACTTGGATGTCATGTAAACCTTGCTTTTGAGCTGCAT
CTACTGCTGCATCAGCTTCTGCTACTTCTTCATTTGTTGCATTTGAAACTGTAGCATTTT
GAGCTTTTCTAGCTGTTGCAGCTTGTTTAACTTCATTATAGGCATCCATTTTTGTTTGCG
TAGAGTCAGTAATATTTTCAATTTTTGAGATTTCTTCGTTTTTAACTCTTTCTAAATCTT
GTGCAGTCGTTGTCGCTTCAATTGCTTTAACACCAGAAACTTTAGCTGCATTAATACGTT

CAATAGCTTCCGCTACTTCTTCATTTGTTGTATCAGGATTTAAAGGTGCTTGATCAATTT
GTGCTTGAACAACTTCGTCAAATTCTTCAAGAGCTGCTGCTTTAGCTGTTGTAGCAGGTG
TAGTTTGATTAATATCATTGATTGCTTTTGTTTTAATGGCTTCTACTTGTGCATTTGTTG
TTGCTGCATCAATATCTTTAATTGCCTTTGTTTCAATTTTACCAATTTTATCATTTGCTA
CATCTTTTTCATCTTGTAATGATGCATTTGACTTTTTAATTTGTTGTTTACGAGTTGTAA
CTGCTTGGATAATATCTTGTTTCGCTTGAGGTTTAACTGTTGGTGTAATCACATCTTGTT
CTAACACTGCGATACCATTATCTTTTTCAGTTGTGACACCTTGTGCTGTAGTTTGTTTAT
TAATTTCTGCGATTGCATTATTTTTATCATTGTTAATTTTAGTTACAAGTGCTGCAACTT
CATCTTGCGTAACTTTTTTACTTTGTTGTGCTGCTGTAACCTTTTCTTGAGCTTTAGTAT
CTAATTCAGCAATTGCTGCTTGATTATCAATTAATGCAGCTTGTAATTTAGTTACTAAAC
CATCAATATCCGCTTGAGATGCACGATTTGCAGTTTTAACATGATTCGCATCTTCATTTA
AAATAGTATCTGCTTGTTGTTTAAGTTTATTGTATTCTGCAATTGATGCTGTTGTGTAAT
GACTATTATCAACTTGTGAGTTTACTTGTTGTTGCAACGCATCTTTGTTCATTTCAACCG
CTACTGAAAATGGATCTGCAGTTAGTGTAACTTCTGGTTGCGCATTATTAATTACAACAT
CTGAAGCAGTACGATATGTTAATTTTTCATTAAAATCAATATTTTTAGGTGTATCGATAT
TCGCAACATTAACTTTATATGATAATTTTAAAGATTTATCTGGGAATAAAACTTCTTTAG
TGTGTGTACCACGTGCCGTTGTCACACCTTGGCTTGTAAATGTAACTTTATTTGCATTTT
GATCATAATTAACAGTCATATTTTTCAATACTGTACTGTCTTCATTACCATTAGGGAATG
TTGTAGTTAATGAATTATTAACGTAAGTTACACCTTGTGGTAATGTTACTTCATATTTAA
ATTGATC
LOCUS 35B (P15)
CAATTCTTATTTATCTGATGAAGTAACACGTGTCGGACGAGGTACATTACGTAAAATTGG
CCCTAAAGATAGAATTATAAAACCATTAACATATCTTTATAATAAAGATTTAGAACGCAC
TGGTTTATTAAATACAGCTGCATTGTTATTGAAGTATGATGATACAGCAGACCAAGAAAC
TGTTGAGAAAAATAATTACATTAAAGAACACGGTTTAAAAGCGTTTTTAAGTGAATATGC
TAAAGTTGACGATGGCTTAGCCGATGAAATAATTGAAGCGTACAATTCACTTTCATAATT
TATTGAGCTTTGTTTGAAACAAGAAGTTTCCAACGTTATTCGTTAACAATCAGTAATAAT
GTAGTAGTTCCCTTGAATTAACAATATTAAATTTCTGAACATAAAAAATACTCCCTTCAA
CATAGACACTTAACTTGTGTTATGTATGAAAGGAGTATTTTTGCGTTAATAATTTGTTTT
ATTTTCGAGCCACAGCCACCTATTCAATGGCTATTGGTCATTACTAAAACAAATTCATAT
TAACTGTTAGACTTGGTTACTTAGTAAGGAATATTTCCCTATGAAATAACTAGATGTTCA
CATTCTTGAATAAATTTTATTCTTCAGTTTGTTGGTCTTTCTTAGTGAATCTTCTAATTA
AGAATGCCATACCTGCACCTAGAGCTAATTCAGCATATGGTAAATCGTCATTATGTGACA
TACCAGTATCTGGTAAAGTTTTAGCTTGTTGTTTAGCTTTATTAACTTTTCCTTGTTGAG
CTGATTTTGTCTTAGCTTGGTGGTCGTCAGTGTTAGTTACATTAAGCATATCTTGATTAG
CACTATTGCTTCCATTTGAAACTGTAGCTGGAGATGCATTGGCACCGTCGTTTTGCGTAG
CTTTATTGTTTGCAGCTGAACCAACTGATTTTTGCGTATCATTAGTATCTGCTGTTGCCG
TATCATCTTTTTGGCTAACATTAGTTGAAGTCATTTTTTCTTTTGCTTCAGAAGATGCAG
ATGTTGATGGTTTATTCGAAACTTCAGTATCAGCTTTGCTTGGCGATTTATCTGCTTCGT
TAGATGCAACGTTAGTTTCAGACTTAAGTTGTCCTGCATCAGTTTGATTTGTCGTACTTT
CTTCTTTATCTTTTGATGTATTAGAAGGTACATTTGGTTCTGTTATGTCTGCTGAAGGCA
ATGTTTCAGTTGTTGATTCAACCATACTTTGATTTGTTGAATCACTACCATCTTTTTCTG
CCTTAGCTTTATTTTCAGATTTTGGTTGTGCAACCTTGTCATTAGTTGATTGAGATTCAG
CACTATTATTTACTTCAGCATTTTGTTTTGAATCATTTACAGATGCATTATCTTTGCTAT
CAGCAGATGATGCTGCTTCTGTGCTCGCAGTTGTTGGAGCCGTTGCTGTTGATCCTGTTG
GTGCATTCTCGTTTGTTGCTGTAGTTGTACTATTGTTATTTGTTGTGCTTTCTGCTGGCG
TTGCATTATCAGTTTCTGTTACAGGTTTATCAGTTGTGCCGTTATTAGTTGATTCTACTT
CTGGTTTACTAGTTACATCGTTATCCATTGTCGGACTGTTTGTTGATGCATCTACACTAG
AATTGTTATTAGCTTGCGGTTTATCATTTGCATCATCAGTTGCTGATGTTGCTGTTGTTT
CACCTGTTGCCGCATCACTATTATTTGGTGTTGTCGGAGAAGCGTCTGCTTTGCCATTAG
CTGTCGTCTCAGATACGTTAGGTTGTCCAGTATTTTCTGGTGTTGCATTAGCATTTGAAT
TTGCTGTTGCATCATTATTATCTATACCATTATTAGTATCATTAGCATCTGGATCATTCT
GAGGCACAATCGCTTCAATTGCAGGTATCGTTACATTTTGTAATTCAGCAACTTCTGCAT

TTGTTTGTGTTTTATCTAATTTATCAGCAAATCTGTCAAAATATCTACCTAAATCCGTAC
GTGCAATTTCTTTCGCCGATGCATCTGCATCTGCATTTTTAATTATTTCTATTTGCTTGT
TAACCACTTCTCTGATTGCTTCCAAAGCATTTTTCTTAACTTCAGGATTAATACGTTGTG
CTTTAAGTTGTTCAAGCGCACTATTTTTGACAGTAGCGATTTCTGCATTTGTAGTTTGAT
CAGAAATATCTTCAGTTGCTTTTGATAAAATGTCTTCTAAAGCATTCGTAAACGCTTCTT
TTTCTTCAGTTGTAGCATCAGCGTTGACATTTACACCTGCTTCAATCTGGTCTAGTGCAG
TTTCTAATTCTTCGATAGCTTTTTGTTTTTCTGTTGAGTCGATTTGAATGTTATCAAATG
CTTCAAGTCCTTGAGCTTTCGCTTTTTCAACTTCAGCAGTTGTTGTTGCATCAGTAATAC
CTTGTTTAGCTTGATCTGTAATTTGTTTAATCATTGCTAATGCTTCAGTTTTTTCTTCAG
CAGTTAACTGGTCACTTTGATCAATAGATTCTTTCGTATCTTCTGCTTTAACTTCAATAG
CTTGGTTCGCTTTAGGTTTAACAGTAGCATCTACTTGAATAGCATCAATTGCTGCTTTAC
CTTGTGTTAATGCATCATCAACGTCACCATTATCCACACCATTATTAATGCTTTCTAATG
CAGTTTGAACATTTTGGTCAACTTGCTTAATTGCTTGTTGCTTTTCATCTTGTGTTGCAT
TAGTGTCAGCTGAAATATTATTTTTCTTCTGATCTGCATAAGCATATAAATCTGTTGTAG
CTGATTCTTTTTTACCTGTTGGAATTGTGTAATCGTTAATATTATCTAAGTCATTATGAA
TTTGAACTTCAATGTCATCTTTAGAAGTAGCTTGATTAACATTTTGATCCGCAGTTTGTT
TTAATTCAGCAAGTTTTTGTTTCGCTTCAGCAATTTCACTTGAAGTCGATGCGTTAGAGT
TATCCGCTTCGTTTACTTTAGCATTATATGCATCTTCAATTTTAGCTAAAGCATCTTTTT
TGTACTCACTAAATGTTTTAACTGCATTAATTTTAGCTTTTCCTTCTTTAACTGCATTAT
CAACATATTCATTTGTTGATGATTGATCGACATTTGTTTTCGCTTGATTTAATTCAGTAT
CAACTTCTTGTTTTGCATCATTAATTTCTTGTTGTGATGCATTTGGTGTTTGTTCTATTT
GTGTTTTCTTATCAGCTGCAGCTTGATCTAATTCTTTTTTACCTGCTGGTTTCTTAACAG
GATTTGCATGAAGTTGTTGAACTTTTTGTACTGCTGTATCTTTAGCAGTAGTTACATCAC
CTGTAGTAGTTGCTGCATTAATATTATTTAAACCTTCTTCATATGCTGCTCTAACTGGTC
CAATATCGTTACCTTTTTCTTCATTAGTAGTCTCATTATTATTAAGTATTTCAGTTATTT
TATTTTGCATTTCAGTTAGCAATTCCGCTCTTGCATTCGTTTTAACATCTGTTGATGCTT
GAATTGGGTCAATTGCTTGAATTGCATTATCTTTTGCAGTGTTTACATCATCGATTGACT
GTGCATTTTCAATATTTTGATTACCTTGTGTTAATTGTGCGTCTACTTGTTGATTTGCTT
GTTCTTTTTCTTCAGTAGTCGCATCTGCAGTTTGTGCAATAAGCGCTTTTTGTTCGTTTG
CTTTTGTTGCTAATTCATCTTTCGCAACATCTTTAATTGTTGTATCTGCAGTAATACCTT
GAATATCAGCAACTGCTTGATCTTTAATTTGCGTAACATCATTAGTTGTTTGTGCATTTA
AGATATCTTGATACGCTTTTTCTTTAGCTTTTAAAACTAAATCTTTTGCTGCATTTTTCT
CTTCAGTTGTAGCACCAGTTGTATTATCAATTGCTTGATTTTGAGTTGTCACAGCTTGAT
CAACATCATTTTTAGCATTTGATTTAACCGCTGTTGCTGGTTGCGTGCTTTGAATTGAAT
TCTTTCCAGCGTCTTTCGCCTGATCTACACCATTATCATCAGTTGCAGCTGTAATATTAT
TTTTCGCGTCTGTAACTGCTGTTGCTAATTGTTGAATAGCTGCTTCTTTTTCTTCTGTTG
TAGCGTTCTGATCATTATTGATAACATTTGTTTGCGTTGCTTGTAATTGATCAATTTCAT
CTTTAGCCGCTTGTTTCTTCACAACTTTTGGTGTTACCGCATTAATCGCTGCTTCTGCAT
TTGCTTTAGCTTCATCAACTTGTGCGTTAGTAGTTGCTGCTGAAATGGCTTGATTTGCTT
TACCATTTTCAGTATTTGCTTCAGCATCAGCTGCTTGTTTTTCTTCATCTGTTGCATCTG
GCGTAGCTTGAATCTCTTGCAATTTGTTATTTAAAATTGCTGTGATTTCATTACGTGCAG
TTGCTTTTTTATTAACTGTTGGTGTTACTTGATCAATACTATTTTCACCTGTCGTTTTCG
CTTGGTCTACATCATTTTGACTATTAGCAGCTTCAATGTTGCTATTTGCTTGTGTCACAG
CATTATCTACGTCCGCATTAGCCGCTGCAATTTCTTCAGCAGTAATGTCTTGCGTTTGAG
CGATTGCTGTTTTACGTTCATTCGCTTTCGTAGCAATTGCTTCTTTCGCATTATCTTTAG
TTGTTGTTGCTGGCTGAATCGCTTCAATTTTAGCAATTGCTGCTTTTTTAGCCGCTTCAA
CTTCCGCATTTGTATGTGCTGCATCTATTGCGGCATCAGCTGTTGTTTTTTCAGTTTGAA
CTTGTTGTTTAGCAGCTGCTTTTTCTTCAGTTGTTGAGCCGTTATTTCCATCAATTGCTG
TTTCTTGAGCTTGTACTTTATCTGCAATTGCTTGTTTTGCTGCTGGTTTAACATTTGCAT
CAGGTGTAATGGCTGCGATTGTAGCTTCATTTGTAGTTTTTGCATTATCCACATCATTGT
TTGCTGCAGCATTATCTATATCAGCGTTTGCAGTAACTACTGCTT
LOCUS 36(P5)

GATCATCTCTATCAATTTTTATATTAAATTCATTTTTTTGAATCGATAAAATAAACTCGA
TTAGCTCTTCCTTATAAGACCTATTATATTCAATTATGTTTATAGCCATTTTTATCTCCT
TTTTCATTTAATTTAATTATAAAATGTGCGTTTAGTTTGTATCTAGTGTACTCAGTACAG
CCTCAAATGAAGTTTCATTCCACTTGGCACTTAATAAAGACAAGTATTTTAGCAGTAATA
CAATAAAGTCCAATAAATTTCCCTAACTTCAATATCCACTTTTTAAAAAATGTATTTTTA
ATTAATAAAAAAACTCTCCCCAATTTCTATGGGAAGAGCTATATATTTAATGTCTAAACA
TTACTTTTATTTATTATGAAGGAATTAGAATCCCCAAGCACCTAAACCTTGTGCTTTGTA
TGCTTTAACAGCTGCGTTGATTTGTTGGTCAACAGTGTTTGTTGGACCCCAACCTGGCAT
AGTTTGGAATAAACCTGAAGCACCTGATGGGTTGTAAGCATTTACTTGACCATTTGATTC
ACGAGCGATGATTGCAGCCCATGTAGAAGCTGAAACACCAGTACGTTGAGCCATGATTTG
AGCTGCTGATGAACCAGTAGCACCTGCAGTATTACCATTGCTTAATCTCACTGAACTTGA
AGTAGTTGAAGTGCTGTAGTTATGGTAAGTTGGAGCTGAAACAGCTTCAACGTTTGAGTT
ACTTGATTGTGCATTGTAGCTTACTGATTGTACATTTGAACCTTGGTTGTATGAAGTAGT
GTAGTCTGCACCTGCAACGTTTGAGAAACCAGCAGTTTGACCATTAGCTGCTTCATAGCT
CCATGACCATGTAGTACCATTTGAAGTGAAGTTATATTGGAAACCATCTTTTACAAAGTG
GATGTCATATGCACCATCTTTGATTGGAGCTGCATTTAATTGATCTTGGTGATTATGCGC
TAAGTCAACTAAGTGTGCTTGATCAACGTTTACTTCAGCAGCGTGTGCTTGATGTCCTGT
ACCTGCTGCGTAACCTGTTACACCTAATGCCACTGCTAATGATGATGCCATAATTGTCTT
TTTCATAGTAAAAAATCCTCCAGTAATAATTGTAAGTTTATGTTTTTAGTAATTATATTT
TGAATTTGAATGTCGTAGTGCAAGTTTAAATTGTCTTTTATTTCTTTCAACGGTACTCAC
TATATCACAAAAAACCAGCCAGTAAATTACACTTTCTTTACAAAACATTACAATATCAAG
TGTTATTTGTAATGTTGAAATATGGCTGTTTTATACTGTAATGTGAAATATGTGCCCTTT
AGAATCCAATCAACCCTTGAAATAGTCTTTAACACATAAGATTTTTACTATATTTAGCTC
AACTATTACAGCTTTCGTAATATTACAGATTGTATTTTTGTTACATAGCTGTAATATATC
TGACATGTAACTTCTCTTATTTTCGTACATTAAACGCAATTAAAAAGCAATCAACAAATA
TGTTTCTACACATGTATTGATTGCTATTATTGTTGTATATTCAAAGTTTTAAAACACACA
TCTTTTGTGAATTGTCTTATCTTTTATTAGCGCAAATAAACTGCAGCTCAATTATATTGT
TCAACTTCATTCTCGCAATTCACAATAACATTAAATAATTTTTGGTCTCATATTTTCAAA
AAACATACTGTTATTATCCCATGAATTTAAAAATATCATTAGTATATAAACGAAACACTT
TACGATAAATGATATCTGCAAGCCAAGCTGTTACAAATGGTACAACAAAGAACGCTACTA
CAATTAGTAAGACACTCAACCAAGCAGAATCAACCTCCATAAATTTAAATGCATTAATCG
GTCCTACCATTCCTATAAAACCAAATCCAGCTGACTCTTTCGTTCCATGAATACCTACTA
ATGCTGATACCAAACCTGATACAATGGCTGTCGTTAATATTGGTAACATAAGAATTGGAT
ATTTCACCATATTAGGTATCATCATTTTAACGCCTCCAAAGAAGACGGATAACGGCACCC
CTAAACGATTCACTTTACTTGTACCAATTATCAATACTGCTTCAGTCGCGGAGATACCAA
TTGACGCTGATC

LOCUS 37(P8)

GATCTGGCGTTGGTTCTGGTTCTGGGTCTGGACTTGGTTCTGGGTCAACCGGCGGCCCTG
GAGTTGGGTCTTTCGGATTTACTGCTGAATCACCATCAGCACTTCCACCACCATAACGTA
CAACATTCTCATTATTCCAACCGAAAATACTGTAGTCTCTATTTGTTACAGGATCAACAT
TTTCTTGAATAACCTGAGTTTTTAAGTTCTTACCTGTATTGTCGTAATGCCCTTCTACTA
ATACTACATATGTTTTAGTAATATCACCAAATTTAATACTAGCTACATTTGGATGCTCAT
AATAGATTCTATTTTTAAATTGGTCTGTTACTTCTTTAAGGTTAGAGTCATTTGGATCTG
CATAGTAGCTATCTGATAATTTAGATGTATCATTCACTTCAAAAATTCTCAGTTTTGTAT
CTGTAGCACTTACTTTACCGCTACTTTCTTCGATTTTATCTTGGTAGCCTTTAATATACA
CCCACGTATTACCTAAAACTCGTTGCTTAGGGTTAACAAATACTGTTTGCTTGTATGTGT
TTTGACCTGAAGCTGTATCTACACCAATAATTTGAGAAGAAATGTTCGCGCCATTTGGTT
TATCAATTCCTGCAATTGGCGAACTATAGTTATAAGTAATTTTATTATTAAACATTTCAT
CCGCAATATTAATATTCGCATCATATGTTCCTGATTTAGGTGCCTTTGCTCGGTCTGTAA
ATAAAGGTAATGAAAATTGTCCGTTAATATTTTCTTTATTATTTACATAATCTGTAAAGA
CAAATGTATACGTCTTAGTCAAGATATCATATGTTGCTTTAGCTACAACATCGCCATTCG
TACTTTTAATGTCTGCAATTGGCATCGTATTATTTGAATTAGAATAATCCACGTCTCCAT

TACCAGTTAAACTATCTGGTAACTTCGCTGTAAAATAATCCCCTGATTTCACTTTATCTG
TCACTGTAAAATTTGCCGCCATAAATGTGTTACCACTTTGATTAGGGTCAAATGTAGTCT
TTTCTAACTTGAAATTACTTGCCGTAACTTTATCATTTACATTTGTACCTTTAGCATCAG
CAGCATTTACTACCGGTTCAGCAACAGCTAAACTACGTACAGCTCTCGTTCTAACACTTG
GTTTACTAGTTCCTTGCGCATTGGAAATCGTTTGTGGTGATGATTGTGGTAAATCTAATG
TTTGAGAATTTTTAAGCTCACTGTTTGTTGCTATGCTATTAGCATCATTCGTTGTTTTAT
TATCTACTTGAGAATTTGCTTCTTGAGGAACAGTTTGATCTTGCATTTTTGCAGCAGTTG
CTTGATTTTTAATTGCCGTCGGTTGAGGTGTTTCATTTGTTGAAGCTGGCTCTGTTGTAG
TGGTATTGCTCGTTTGTGTAGACATTGGTTTTGTTGTGCTATCTACATTCGCACTGTTTG
TGTTTGCACTAATATCAGATGTATCATTAGCCGTTGTATTTAATTGAGGTGTTTCTATCA
TATTGTTTTTTTCGGAATCTGCACTTGCATTATTTTTCGAAGATTGCGTTGTATCGTTCG
ATTGTTCTGAAGCTTGTGCTTGATGATTGCCTATCCCAAATAGTATAGTTGCCCCTACTA
TTACTGATGTGGTACCTACTGTAAAACGTCTAATCGAATACTTATTCTGCTTATTCGACA
AATAATCAATTCTTTTTTTCAAAAATATTACTCCATTTCAATTTCTAGATTAGTCTAAAT
TGTATAATGAAATAAGAATTATATCAATTGCTTTTCGAAAAAAATTACGTAAAATTTGTT
TTCTTCCTATTTATATAACTTAAAATTTTCTGTTAACTAGCAAAAATCAATATACTATTT
TTACACTATTACAAATTTTTTACTTTTCAAAAACTTAGAAGTTCTAAATTTTTCATCACC
TTAAATTTTACTGTAATTTCAACAATCAAATTTAACTAACATTTTAAATTATTCATCATG
CTAGCAAAAAAGGCCTAACGTATAAATGTACGTTAGACCTCATGTTCAACTTATTCATTT
TACATTGTATATTAAACACATACATCATTGAATAAATGTTTGCTTACTAACCAATTTTTA
TGATC
LOCUS 38 (P16)
GATCAGCTAACGCTACAAAACTAATAACAAATGCGATGATGATTAATACTAATTTACCTG
CTGCTAATACAGAATCTCCAAGGAATGAGAAGAATGGTTGACGTTCAACTTCATTGTTTT
TAAGACTGTAAATAATATCTTCTTTCTCTTCAACACTTACTGGATTCAACAAGCATGACA
CAATAATCGCGTTAACGATATTTAGTGGAATTGCCGTTAGTACCAGTTCTCCTGGTACCA
TTTGTACATACGCACCTACAATAGCTCCCGATACAGAGCTCATTGACATCATTGCGATTG
TTAATACACGCATTTCATTCATACGTTTTAGTTGCTCACTTGATACGGCTAATGCTTCAG
TATTTCCTAAGAACATCATTTCTATCCCAAAGAATGACTCGAATTTAGGTTGTCTTGTTA
CTTTAGCTAGTAACCAACCAATACCTCCAATAATTTTCGGTAAAATATTAAAGTACATTA
AGATATCAAATAATGGCACTATTAATAATATTGGGAATAAGGCTGCAACAGCCATATCCA
TCATTTTAACATTTGTCAAACTTGCAAATGCAAAACCTGTACCAGCATGCGCTGACTGAA
CTACCCAAGCGATACCATTGGCTGCTCCTCTTACTGCTTTTTGACCCCAATCAAAATAAA
TAAAGAACCATGCTAAAAACAGGTTTAAAACAACTAAGATC
LOCUS 39 (HB3)
GATCTTTCGAAATTGTTTCTTCAAAAGTTTTTGGATGAAAAGTTAATTTTTCTGGAAAAC
ATAACTGTTGTGCCATATATCCAAAACTTTCTTGATATTTTTTAAAATTATCGAAATTAA
TCACGGAAAATCCCTCCATAGAAATTCTCATTATAAATTTCTTGACCAGTTTTCCCTGAA
CCTACTGCAACGCCACAGCCTTCACAGTTATCTCCAAAATGCTCGCCGCCGTAATTGTAT
CCTGTACTACCTTGTGCGTGATACGTATCTAAATAGGTTTCTTTGTGTGATGTTGGAATA
ACAAATCGATCTTCATATTTGGCTAGTCCTAATAAACGATACATGTCTTTAGTTTGGCGC
TCGGTTATACCTAATCGCTCTAATCGAGACGTGTCAAATGGCTGTTGAGTAACTTGAGAT
CTCATATAACTTCTCATCATTGCCATACGTTGTAGGGCTCCTTTTACTGGCTCTGTATCT
CCTGCAGTGAAAATATTAGCTAAGTATTCAATAGGTAAACGCATTTCTTCAATGGCTGGG
AAAATCGCATCTGGATTTTGAGTTGTATTTTTACCTTCAAAATAGCTCATAATTGGGCTA
AGTGGTGGGCAATACCAAACCATCGGCATCGTTCTAAATTCAGGATGTAACGGAAATGCA
AGTTTATATTCAATTGCTAACTTATAAATTGGAGAGTTTTGTGCAGCTTCAATCCAATCG
TAACCAATACCATCTTTTTCAGCTTGAGCAATGACTTCTTCGTCAAATGGGTTTAAGAAT
ATATCTAATTGTTTTTCATATAAATCTTTCTCGTCTACTGCTGAAGCTGCTTCATGAACT

CGATCTGCATCATATAATAAAACACCTAAGTAACGCATACGTCCTGTACAAGTTTCAGAG
CATACCGTAGGCATACCCGCCTCGATTCTCGGGAAACAGAAAGTACACTTTTCAGCTTTG
TTCGTTTTCCAATTGAAGTAAACTTTCTTATATGGACAACCTGTCATACAGTAACGCCAT
CCACGACATGCGTCTTGGTCAACTAATACAATGCCATCTTCATCACGTTTATACATAGCA
CCTGAAGGACACGATGCAACGCAACTTGGATTCAAGCAATGTTCACATAAACGTGGTAAA
TACATCATAAAAGTTTCGTCAAATTGGAATTTAATATCTTCTTCTATTTTTTGGATGTTA
GGATCTTTTGGACCTGTAACATGACCACCTGCTAAGTCATCTTCCCAGTTAGGTCCCCAT
TCAATTTCAATGTTATCCCCCGTAATTTCTGAATACGCTCTAGCAACTGGCGAATGCTTC
CCTGATTTCGCAGTTGTTAAATGTTCATAATTATAGTTCCATGGCTCATAATAATCTTTA
ATTAATGGCATATCTGGGTTATAAAAAATTTTACCTAAAGCAATTTTTGAAATTCTACTT
CCAGATTTTAATTCAAGTTTCCCTTTACGATTTAGTACCCAACCACCTTTGTAGTGTTCT
TGGTCTTCCCAACGTTTCGGATACCCTACACCTGGCTTCGTTTCTACGTTGTTGAACCAC
ATGTACTCAGCACCTGGACGATTTGTCCAAGTGTTTTTACATGTCACACTACACGTATGG
CATCCTATGCATTTATCTAAATTTAATACCATCGCAACTTGCGCTTTAATCTTCAAGCCA
ATTAACCTCCTTCATCTTTCTAACTGCTACATATAAATCCCTTTGGTTCCCAATTGGTCC
ATAATAATTAAAGTGATAACTAATTTGTGCGTATCCTCCGACTAGTTGTGTTGGTTTCAA
ATGGATTCTAGTCGGCGCGTTGTGTGAACCACCACGTGTATCTGTAATTTCTGACCCAGG
CGTTTGAATATGTTTATCTTGTGCATGATACATAAACATTGTACCTTTAGGCATACGATG
CGAAATAACTGCTCTTGCCGTTACAACACCATTACGGTTATACACTTCTAGCCAATCATT
ATCTTGGATATCGTGTTTTTCAGCATCTTCATTTGATATCCAAACCGTTGGACCACCTCT
AAATAGTGTCAACATATGCTTATTATCTTGATACATTGAGTGTATATTCCATTTTCCATG
AGGCGTTAAATAACGCAGTACCAAAGCATCTGTACCACCTTTAATTTTCTTATCTCTATT
CCCAAATACCATTGGCGGCAATGTCGGTTTATATACTGGTAAGCTCTCCCCAAATTGTTG
GAAAACTTCGTGATC
LOCUS 40 (HB5)
GATTCATCAATACTTTTGAAACACCACCTAATGATGCAATGTCTTGTTGGGAGTCACCTA
AGTGTCCGGAATGATAGATAACAATATTACCTGTTTCACGTTTTAAAATAAAAGATTTAA
ATAGAAATCGATTATCAAAAGGCAGTTCCGAAGTAGGTGTCGCATATAAGTTTTTTGTGA
TGGATTCTAAACTGTCATGTAATTTGGACTGTTTATTTTTAAATTGATTAGTCATTTTAT
TTCATCCTTCGATTAATTTGAATTGTACATACGCAGTACCCTTTATTTAATTTAATAATC
AATGAGAGTCTTTCAAACTTCGATTTAGAATATGCTTCATACAATAAATAAGTACTTGGA
GCACTAAAAAATTAAATCTTTTAGTACAACATTAATGAAAACCTAAAAGTTCATCCTACA
ATGCTACTAAAAAAAGGGGAATGGAACAGAAATGATATTTTCACAAAATTCATTTCGTCG
TCCCAGACCCGCTTTGAATTATAAATTATCGTCTTGTTCTTCTTCTGATACTTGAACGAT
TCGCAATGAACGACGTTCAACTTCTTTTAATTTTTCAGCACGCGTTTCAAGTTTAATTCT
ATCGCGCCCTAAAATGATTAAAAATGATATCATCATGAAAATAAAAATAACAATTAATGG
CACACTTGCCAGTATTGAAGCAGTTTTCAATACTTCTAATGCACGTTCACCACCAACTAG
CATCAATGAAAATGGCAATAAGCACAATGCAAATGCCCAGAATAAACGATTGGCACGTAA
TGGTTCGCCTACCACTTTTTTCTGAGATGCTGCCGCTAAAATATATGAACCCGAATCAAA
TGTTGTTGCTAAGAATAAGAAAGCAGATACTAAGAATAGTACAATCATCAATGATGGGAA
TGGTAAATGATGCACCACTTCAATAATGGTTGCCTCTGTACCATGTGTATTTAAATATTG
TGTTACATTAAACTGTCCAGAAATTTGTAAATACACAGCATAGTTACCAAAAATACCAAA
GAATAATACGCATCCAAGCGTTCCATAAATAATTGTTCCTAGCACGACTTCTTTAAGGCG
TCGACCTTTTGAAATTCTAGCGATAAATAAACCGATAAATGGCGCATATACTAACCACCA
TGACCAGTAGAATATTGTCCAGTCTTGTGGGAAATTCGTTTCTTTTCGACCTTTAATACC
ACCGAATGGTTCTAACCATGTTGCCATATGAAAGAAATCTCTCAACATATTTCCGAACCC
TGTCACTGTCGTTTCCATAATAAAAACAGTCGGTCCAATAATAAATATAAAGGCTAAAAG
TACAAAGGATAGCCAAACGTTGATATCACTTAACTTTTGAATACCTTTTTTCAATCCTGT
ATATGAACTAATGGCAAATATAACCGTGATTGTTAATAAAATGGCCGAACGTAAAATCAT
ATTTTTACCATCTAAACCAGTTAATCTTTCTATGCCTGCAGAAATTAATGGCACACCTAA
CGCTAGTGATGTTGCCGCACCACCTAGCAATCCAAAGATAAATAAGATATCTACAACTTT

ACCTACAAATTTATCTGTTTGACCTTTTAAAATCGGACGACAAGCTTGACTAATTTTATA
CACCGGTTGTTTTTTAACAAATACTAAATAACCAATTGGTAATGCTGGTAGAACATAAAT
AGCCCAAGCAATTGGCCCCCAGTGGAACATACCATATTGCGTCGCATATTGGAGTGCTTC
ATCACTCATACTTTTCGCGCCATTTGGTGGAACTTGATAGTAAAAAGCCCATTCAATAAC
GCCCCAGTATAAAATATCAGAGCCTATGCCTGCACAAAACAGCATTGCCGCCCATGTAAA
TGTATTAAATTCTGGTTTATCACTTGCTTTACCAAGTGTGACATTACCATATTTACCAAA
TGCGATATACATTACAAAGCAAAAAATCGCCAGCCCCATAAATAAATATATCGAACCAAT
TGAATCAGAAATGGCACTATTAATACCAGTGATGATATCTTCACTTGCTTTTGGAAAAGC
CATCATAGGTATAACTGCAAAAAGAAGTACAGCTACTGTCCCTATAAAGGTCGTCCAGTC
CATAACTTTCTCTTTTTTCAATTGTGCTCCCCCTAATTATTAATTTTATGAATCCTGTTT
CGATTTATCTCAAAATGTAATAATTATATTGATTCACAAAATTGACAATAACTAACATTT
AATAATAATGCAAATTTCATACAATTTGAAACTTGGCAATTATTGAATATTTATATAATT
TTTCCCGTAATAAACAAAACCTTAATAGCGCTAAAATAACAGTGTTAAGTTACGATTTAA
CGAATTTAACAAATTTTACTAGAATGGCATTTAAGAATATTTATACGTTATTAACGAATA
TTTATTTATTGTAAAACGCTACCAAAAAGTTAGACTTCCTTCCCACTAAAATACCACTTT
TCTCTTTCAACTTTTTTAAAAAACGGATATGCAACTTTTAGTATTGGTATCAAAATGATT
GTTAGGTCATATTCTATCAATATATTTTTATAAAGAATTGCTTTTATTAACTTTCAATTA
TGTACCTAACCTAAAAAGAAGCCAAGGCAACGAATGTTACCTTGACTTCTAATACATATT
CAACTAACTATATATTCAATCATACGCGCATGCGAGAGTGATTGTTGTACATCTATAATG
CGTTGATTTAAAGAACCTTTATATGGTAAATCAGGTTTGAATAAGTGTTGTATAAATAGA
CCATCTACTAAAACGTCAATGTATGATAATAACTCTCGACGTTCTGTACAATCATTTGCT
AAATATTCATATAAAAATCCAGTCCATACCCAAATTGTCTTTGTATTTCCAAAACGTGCT
CGAAATGCTTTGACAAGATTTAATGTAATATCCAAATTACAAAATGGTTCGCCACCTAAT
AGACTTAGCCCAGATATATAATCATGATCGCAATCATCTAATATTTCTGCTAATATTTCA
TCAGTGTATTTCTCGCCATATCTGAACTTTTGTGAGGCTTTGTTATAACATCCAACACAA
TTAAATGGACATCCTGATACATAAACACTGCATCTTACTCCTTCACCGTCAACAAAGCTA
TTTGATTCTATTTTAGCAATATAACCTTGTCCTTGTTTAATGTCTAAAAGTATCATTCTT
TAGGCGCTTTCATATGTTTTACTCGTGCGCAAATTTCTTTATGACGGCCTTTAATTACTG
GACGTTGAACTGGATTGCCTAGGTAACCACATGTTCGTTTAACGACATCAACTGTTTTAG
GATTATCATTGCCACAGTTCGGGCATTTAAATCCTTTTTCAGTTGCTTCAAAATCTCCAT
CGTAATCACATTCATAACAATGATC
LOCUS 41 (HB7)
GATCTACATTATATTGCTCAAATAAAGGCGATAATACTTTAGGATTTGGCTTCTCATAGG
CATCCGCTTCGGTAGAAATGATCAAATCGAACAACGAGGTAGCATTGGTATGTGCTAAAA
ATTGTTCTACACCTTTTTTAGTATCACTCGTAACAATACCAAGTTGATAGCCTTTTGCTT
TCAAATCGATAAGTGCTTCTTTAACACCTTCTACCCAATTAATTTCAGGAATACGTTCAT
CTACCAGCTTTTGACTTGTTGACTTGGACCAGTCGGTTGTATCTTGTCCCGTCACATCAT
TAAATGCCTGGATAATTTGTTGTAAAGATCCTGAACCCATCACTGATTTTGGATCAATAG
ATTCTTTAATGACACCGAGTTGTCTTAAAGCAGCTTCTTTATTATGTACTGGGAAAGTCT
CAAGCAATGATTGTACAAATCGTACCCCTATTTTTTCCCAACTTCTATCAAATTCAATTA
ACGTACCATCTTTATCAAATAATATCCATTCCATTGATATCAATACTCCTATTTATTTAT
TTCGTATTATGCTGATTCTATGATATTCGTTATCCCCTGAAAATGAACTCGTAGTATTGT
TCTATTTAAATATTGAATTAAATATAATAATAAGTGAAATCCCCTTCAATACTTAACAAT
AAACATTGTAAACTTAATTTATTACCATGCTTCGCTTCATTGAAAGGGATTTTAGTCATG
ATTAACTTTTGCATATTGTTTTCATGATTATATTCAATTTTTATTAATATTTTGGTACAA
CGACTCTCCAACCATTTTTATCTTCTAAAGTACCATTTTGAATACCAGTATAGACGTCGT
ATAATTTTTGAGTAATTTCACCAGTCTCATTATTATTAATAACGATTTCACGATCTTCGT
ATCTCAATGTACCCACAGGTGAAATAACTGCTGCAGTACCACTACCAAATACTTCTGTTA
ACTCACCTTTATCATATGATTCGAATAATTCATCGATTGAAACGCGGCGCTCTTCGACTT
CATATCCTAAGTTTTTAGCTAATTCGATAATAGATTTACGTGTAATACCAGGTAAAATAC
TGCCATTCAACTCTGGTGTAATTACTTTGCCATTTTCAACGAAGAAAATGTTCATGCTAC

CAACTTCTTCGATATATTTCTGTTCAACACCATCAAGCCATAATACTTGGTCATAACCTA
ATTTATTTGCATTAGTTTGTGCTAATAAACTTGCCGCATAGTTACCTGCAACTTTTGCAA
AGCCTACACCGCCACGAACAGCACGCACATATTCATCTTCTACATAGATTTTAGTTGGTT
TTAAAGTTTCACCACCATAATATGCACCTGAAGGAGATAAAATAATTAATAATTTATACT
GATGTGATGCACCAACGCCAAGTGCCCCTTCTGTTGCAAAAACAAATGGACGAATATATA
ATGATTGACCTTCCCCTTCAGGAATCCAATCTCTTTCAATATCAACTAATTGTTTTAGCC
CCTCTAACAATTCTGCTTCGTCTACTTGAGGCATTTCTAATCGTGCTAACGAGTTATTAA
GACGCTTAAAATTTTCTTCAGGACGGAAAAGTGCAACTTCCCCATCTCTTTTATATGCTT
TTAATCCTTCGAATACCGATTGACCATAATGAACACCTTGTGCAGCAGGTGAAATTTCAA
TAGGACCATAAGGTACTATCTTCAAATCATGCCATCCTTTATCTGCATCATAATCATAAC
TCAACATATAATCAGTAAAATATTTACCAAAACCTAGTTGAGATGTATTTGGTTTTTGTT
TTAATGTTTCTCGTCGTTCAACTTTAACTGCTTGTGACATGGTGATTGCCTCCTAATAAT
ATTGTATAAGAATTTGTTTAACTTAAATTATAACAATCCATATTTTGCTGTTCAACAAAT
TTTCTAAAAATTCAAAATTAATTAACAGATTTCTAGAAAGACTATATCTTTTAGTATAAA
CGTATTAATTTCACAGAGACAAGTAATCTGTGTTTTACTAATATACTTTACATACAAAAA
ACTCTTTACTTTAAAATGAACTAAGCTCGCGAATTCAATAAGTATAATGAATAATATTAG
AATTCATGCACTAGTTTATTAAAATAAAGAGTAATTTAAAATATCATTCCGTGTATTAAA
GTGAATGGAAATGATTAGTTATTATTTTTAACAGTATCTTTTTGTTCAATAGCTTCTAAC
ATTAATTTAGTCATGCTCGCTAAATCATATTTAGGATC
LOCUS 42 (HB8)
ACGGACTAATATTTCAACTTCCACATTAAAGACACGTTTAATCAACGAATAAATACGTCT
TGCCGTTGTTGCATTTTCCGTTTGAACATTTATAACAAATTGTTGATTTGAAAGACTAAG
TGCACCATTCATTCGAATCAGTGCACTGAGCTCTGCTTTTGCATTCATTTCATCGACGTC
TATTCTAGTTAATTCATTTTTCATTTCTGATGCAAAGCTCATCGTACAGTCATTCCTTTC
TTATTTAAAACATGATTCACCTTAGAACCACTGTCTATTTTCATTTTTTTCACAGCTCTA
TTATCATATCATAATATGATTACGTTCTATATTATTTACGTTTATCACTTGGTACGAAAG
GAATAGTACTAATTAATTCTAAAGCTATGTCATAAATCATTGTCGATAACACTTTAGTAT
TATGTCTTACTAAATGATTTTCAGAAATTTCAACTAAATTTGAAGATGTTTTTACATTTA
TGCTTTCTTTTTCAAGTTCAGCCTTATTAACTTCAACTGGTTTAGAATGTTTTTCTTCAT
ATTTTTTCAAAACTTGAGCATTGAAAGTTTGTGTACTACAAATGACATAATCAATAAACG
GTTGTCCAGCTTGTCTATGAATCGCATCGATATGATCTTTCACGCTATAACCATCTGTTT
CCCCAGGTTGCGTCATCACATTAGAAACATATAGCTTAGGCGCATCAGAATGAATTAACG
CATCTGAAATACCATTCACACATAAGTTAGAAATAACGCTCGTATATAATGACCCTGGTC
CAAGAACGATTAAATCTGCTTCCCTTAAAGCATCGATTGCTTCTTCCATTGGTTGCACAT
CGTTAGGTTCTAAAAACACACGATCAATTTTTTTATGTTTTTTTAGGAATATTTGTTTCTC
CAAAAACAATTTCTCCATCTTCCATAACAGCATTTAATTGCACACTTGTATTTGTAGATG
GAATGACTCTACCTTTAATATTTAAAATTTTACTTAATGCTTTAATGGCATGTCCGAAAT
CATTCGTAATATTAGTCATACCTGCGATTAATAAATTACCTAATGAGTGACCGCTAATTT
GATTTTCTTCAAAGCGATACTGAAAAAGTTGGCTTAAAACTGACTCAGAATCACTTAAAG
CTGCAATCACATTTCTGATGTCTCCTGGTGCTGGTATATCCATTTCATCTCTGATTTTCC
CTGTACTCCCACCATTATCAGCAACTGTTACAATCGCCGTAATATCAATTGGGAATTCTC
TTAATCCCCTAGCCATAACTGATAAGCCAGTGCCACCACCGATAAGTACAACTTTTATTT
GTCTCATTTTTTCTCGCCACTTTCAATATGTGCGTCCCTATGATGCACATAAACATTATA
TTCAAATACTTCATTTAGATAATTACCTAGTCGTTCTGCTAATGCTACAGATCGATGTTG
TCCACCCGTACAACCGATGGCAATTACTAATTGAGATTTCCCTTCTTTTTTATACCCGGG
TATCATAAAATCTAACAAATCAGTTAATTTTTCAAAGAAAATCTCCGTCTCTTTCCATTT
CATAACATAATTATAAACGTCTTTATCTAATCCTGTTAAAGGTCTTAAATCTACTACATA
ATATGGATTTGGTAAAAATCGTACATCAAATACTAAATCTGCATCCATCTGAATCCCATG
TTTAAAACCGAAACTTGTGACATTAATTGTAAAAGTTTCAAACTCTTCATCTTCATAGTA
TCGACGAATGCGTTCTTTTAATTCTTTAGGTGATAACTTTGTAGTATCTATAACAAAATT
AGCTATACTTCTAATTTGAGACAAATGCTCTCGCTCATCATTAATTGCATTGATTAACGA

TC

LOCUS 43 (HB10)

GATCAACTCATTGCAAAATACGATTTATAGACATCAAAGAATCAATACATTGTAAAGGGG
ATGTTGCCCATGAAAGAAGTTGGATTTGGCACACTAAACTGGGTTGCCGTTATCATTTAT
CTACTAGCTATGTTGTTCATTGGCGTTTATTTTACCAAGCGCGCGAGCCAAAGTACCAAT
AGTTTCTTTACCGCAAGTGGTCGCTTGCCATCTTGGGTAGTTGGCTTTTCAATTTATGCT
ACTACGTTAAGTGCGATTACATTTATGTCGACACCAGAGAAAGCATTTTTAACAGATTGG
TCATATATCGCTGGTAACATTGCTATCGTCGCAATTATTCCATTACTTATTTATTTCTAT
GTCCCTTTCTTTAAAAAGTTAAAGGTAACATCTGCATATGAATATTTAGAAGCTAGATTT
GGCCCTAGCATACGTGTCATTGGCTCATTATTATTTGTCGTTTACCATTTAGGGCGTGTT
GCAATTGTTATCTACTTACCAACATTAGCAATCACATCTGTATCAGACATGAACCCTTAT
ATCGTTGCATCACTCGTTGGTTTACTATGTATTTTATATACATTTTTAGGTGGTTTCGAA
GGTGTGGTTTGGAGTGATTTCATTCAAGGCGTCATTTTATTAGGCGGCGCTTTAGTTATT
ATTATTCTAGGTGTTGTGAACATTAAAGGCGGTTTCGGCACTGTCTTTGCAGATGCGATT
GAGCACAAAAAATTAATTAGTGCAGACAATTGGAAACTAAATACTGCGGCAGCTGCCATT
CCAATTATTTTCCTAGGAAATATTTTCAACAACTTGTATCAATACACAGCGAGTCAAGAC
GTCGTGCAGCGTTATCAAGCTTCTGATAGTTTAAAAGAAACAAATAAATCGTTATGGACA
AATGGTATCCTAGCTTTAATTTCAGCACCCTTATTTTATGGTATGGGTACAATGCTGTAT
TCATTTTATACACATGAAGCTGTTTTACCAAAAGGCTTCAATACATCATCTGTAGTGCCA
TATTTCATTTTGACTGAGATGCCACCATTTGTAGCAGGATTACTTATTGCAGCCATTTTC
GCCGCTGCACAGTCTACCATTTCATCTAGTTTAAATTCTATATCTGCTTGTATTTCAATC
GACATTAAGCAACGCTTCTTCGGAAAAGGTAGCGAGCGACACGAAGTTAACTTTGCACGT
TTCATTATTATCATTGCAGGTATTTTCGGTTTTGGAATGTCACTATACTTAATTGCTTCT
AATTCAAATGACTTATGGGATTTATTCTTGTTTGTGACTGGATTATTCGGCGTTCCATTG
GCTGGTGTATTTGCAGTTGGTATTTTCACTAAACGTACGAATACATTCGGTGTTATTTGT
GGATTAATATTGGGTATCATCTTTGCTTATGTCTATAATGGTGTTGGCAAAGGTAACTCA
CCTTTCTATGTATCTACCATTTCATTTACAGTTGCTTTTGTCTTTGCTTATATACTTAGC
TTCATTGTCCCTTCAAAACATAAAAAAGATATAACGGGATTAACAATTTTTGAAAAAGAT
AAACCATCAACATACATTTCAAAAACGGCTACGAAAAAGTAGATTGTTATGATAAAACCC
CGTCACTAAGTTATGATGCGCTGTTGCGCCAACTTGGTGACGGGGTTTAGCTTTGCCATG
AATTTAATTTAGGTACTTCGATTCATTTACAATACTAAGCCAATGATTGATCCTGAAATG
ATTGAAGCTAGAGTTGAACCAAGTAGCAACCTCATTGCAAAGGATGCAACTTTTTCTCCT
TGTTTATCACTAATGCCTTTAATTGAACCTACGATGATACCAACCGTACCAAAATTAGCG
AAGCTTACTAAGTAAACTGAAATGATACCTTGTGTTCGAGCTGATACATCACCCAGGACA
TTTTTAAAATCAAGCATTGCTACAAACTCATTTGTAATTAATTTAGTCGCCATTAAAGAG
CCAGCTGGAACAGCTTCGCTCCATGGAATCCCCATTAAGAATGCGATTGGTGCAAACACA
TAGCCAATAAGCTGTTTAAAGTTCAAACCAACACTACCAAACATGATATTAATTGCTTCC
ATTAATGAAATAAATGCTAACAACATTACGGCTACTACAACAGCGATTTTAAACCCATCC
ATCGCACTATCACCAATCATTTGGAAAAAGGCAACTTTCTTAGGTTTTCCTGTTTTTCCA
TTCAATGTTTTAGTTTCTGTGGATTTCGTTAAGTTATCAATTTCAACATCAGTATCATCA
GATTTATAGGGATTGATTACACTGGCGATGATAAGCGCACTAAAAATATTTAACATTACT
GCTGTAACTACGAACTTGGGTTCAATCATCTGCATATATGAACCTAGCATTGCCATACTA
ACAGCACTCATACCAGACGTCGCAATTGTATATAATTTCGCTCTAGATAATCTTGGAATA
ATATCTTTTATTGTTAAATATACTTCTGGTTGCCCAAACATTGCTGTTGAAATAGCAAAA
TAACTTTCTAAGCGCCCCATTCTAGTTATTTTATTAATAGCGATACCTACATATTTGATA
ATAAATGGTAATACCTTAATATAATTAAAGATGCCTATTAATACAGAAATAAAAACTAAT
GGCAGTAATACGTTTAAAAAGAACGTAAAGCCATTTTTATTTTGTATATCTCCAAAAACA
AAATTTATGCCTGCTTTACTA

LOCUS 44 (HD7)

TCCACTCTCTTCGTTGAATCCAAGATTAACGATTGGCAAACAAATTACAGAAGTAATATT
TCAACATAAACGTGTATCTAAATCTGAAGCAAAGTCGATGACAATAGACATTTTAGAAAA
AGTAGGTATAAAACATGCAACTCGACAATTTGATGCTTATCCACATGAACTTTCTGGTGG
TATGCGTCAACGTGTCATGATAGCAATGGCATTGATTTTAAAGCCACAAATTTTAATCGC
AGATGAACCAACAACGGCATTAGATGCCAGTACACAAAATCAATTACTGCAGTTAATGAA
GTCCCTTTATGAGTACACAGAAACATCTATTATTTTTATCACTCACGATTTAGGCGCTGT
GTATCAATTTTGCGACGATGTGATTGTAATGAAAGATGGAAGTGTCGTTGAAAGTGGCAC
GGTTGAAAGTATTTTTAAATCGCCACAACATACCTATACAAAACGCTTAATAGATGCGAT
TCCTGATATTCATCAAACGCGTCCGCCAAGACCGTTAAACAATGATATTTTATTAAAATT
CGATCGCGTGAGCGTGGATTACACATCACCGAGTGGCAGCCTATACCGAGCAGTTAATGA
TATTAACTTGGCTATTAGAAAAGGCGAAACATTAGGCATTGTCGGTGAATCAGGGTCAGG
GAAATCGACATTAGCTAAGACGGTCGTCGGTCTAAAGGAAGTGTCAGAAGGCTTTATTTG
GTATAACGAATTACCATTAAGTTTATTTAAAGATGATGAATTGAAATCTTTACGACAAGA
GATACAAATGATTTTTCAAGATCCATTCGCATCTATTAATCCAAGATTTAAAGTCATTGA
TGTGATTAAACGACCACTAATCATTCATGGGAAAGTCAAAGATAATGATGACATTATTAA
AACTGTCGTATCGTTGTTAGAAAAGGTTGGCCTAGATCAAACTTTCTTATATCGCTATCC
ACACGAATTATCTGGTGGGCAACGTCAGCGTGTAAGTATCGCGAGAGCACTTGCTGTTGA
ACCTAAAGTGATTGTTTGCGACGAGGCAGTGTCCGCTTTAGACGTTTCAATTCAAAAAGA
TATCATCGAGTTATTAAAACAATTACAGTTAGACTTCGGCATCACTTATTTATTCATCAC
ACATGACATGGGTGTTATCAATGAAATATGTGATC
LOCUS 45 (HD9)
GATCTGAAGTAGCTCGATTTTAAATAGTTTTCAGCAATGACATCGTCTTTTTTCTGTCGGC
GTATTCGGTACCATAACTACTTTTGTACCTTTATTAAACACACCTTTACTGTCAAATACG
ACCTCACCAACACCTTCATGAATTAAAGACATTGGCAATTTCTGAGATAAGACATTCTCA
TCACGGCTACCAGTATAATATCTTTGATC
LOCUS 46 (HE9)
GATCAGATAGATAAAGTATTTTCTTTTTATTATGTTTATCAGAATATGCGCCACCGAAAA
TACCAAATATAATAAATGGAAGTGTTTGACTCATAACCATCATTGATAATTTTAAAGATG
ATTGGTTTGTCAATTCAACAGTAAACCAAATTATTTGTAACGAAAACAGCACAAAACAAC
TCCGACGTAAGAAATTACCAATCAATAAATATGTAAAGTTTCTATTTTTCAAAACTTCTA
AATACAACATATTTATCACCTCTCATAAAAATAATTGAATGCATCCACCAGCTTTTTTAG
ACCTTCTTCTAAACTCTCTTTATCCAAAGCGCAATTAATTCTAATATAATTTAGTCAGTT
AAATATCAATTATTTCGAAATATACATACTACTTGAAACACCATACATAACCCCCAAAAT
GACTACTCAGAGGTTATATTCTACTAATTATGATTATATTAAATATGAAAATATTATCAA
AAAAATCAAATTTATAACAAAAATACACCCCTTAAAGTTAGGTCTTTCAATCCAACTTTT
GGGGTGTATATCATTCTCATCATATTCTAGGTTGTTTTTAACAAACTAAATATAGTGAAT
GCAAATCAACTATTATTTAAATTATGAATTATTTTAATTCTTTCTTCTACGAGCCAATAA
CATTAATCCAGCAATTCCAATTATACTACTAAAGATCAAACCTTTTTGCGTGCTTTCTAA
ACCTGTTTTTGGTAATTCTGCTCGTTTTTTCTCTTGATTAGCTACTGATTCTTTAGCAAT
TTTAGATTTTTTAACTTTATCATTTTTATCCATTGAATGAACTGGGCCATTTGGTTTTGC
TCTGTCTTTCGATAATCCTGGATTGTTAGGATTTACTGGGCCACTTGGATGAGTTGGTCT
GCTCGGCTTCTCTGGGTTTTCAGGTCCTTTTGGATCTTTTGGTTTCTCTCCACCGAACTC
TACAATCTTATCTACTGGTTGTTTTGTGATCTCTTCTGTTGGTTGACCCTCGCCAACTTT
TTCACCTGTTAATGGGTTCACTGTGATTGGTGTTGTGATTGTCTTACTTCCTGGTTGTCC
TTCTTGTTTCACTCGCTCTTCACCAGGTTGTAATTTTGGATTAAACTCACGTTTTGTTTC
AAACGGTATCTCTACTGTTTTTGTTTCTGGTGTACCCGTTTTTGGTCCGTGTTTAATCAC

ATCATCCACTGGCTCTTCGATCACTTTTCCTGTGTCTGGATTCTTGATTCCTGGTTTACC
TGGTACTTTTTCCGTTTGATCTGTTGGTAAGTTTGGATCAAAGATATCTTTATGACCTTG
CGGTATTTTCTCGCCACCGAATTCTGTTAATTCATTAACTGGATCTTTTGTGATTTCTTC
TTTCGATTCACCTTTACTAATAATTTCTCCAGTTAATGGATTTTTTAGTGTTGGCGTCGT
TATTGTCTTCTCACCTTTTTGTCCTTCTCTTGTTACTTTTTCTGTCCCTGGTGCTAAATC
AGGATTAAATTTACGTTCTTTCTCGAATGGAATTTCTTCTTTTTCTACAATCGAGTCTCC
TTTTACAGGTCCATATTTTGTTACGCTATCGACCGGTGGTCTAACTACATCTCCTGTTTC
TGGATTCTTAATTCCTGGTTTACCTGGAACTTCCTCTTTCTCTCCTGTTGGTAACTTCGG
ATCAAATTCGTCTCGATGACCTGGTGTTATCGTTTCTGGTCCGTATTCTGTTAATTCATT
AATCGGATCTTTTGTGATTTCTTCTTTCGATTCACCTTTACTAATAATTTCTCCAGTTAA
TGGATTTTTTAGTGTTGGCGTCGTTATTGTCTTCTCACCTTTTTGTCCTTCTCTTGTTAC
TTTTTCTGTCCCTGGTGCTAAATCAGGATTAAATTTACGTTCTTTCTCGAATGGAATTTC
TTCTTTTTCTACAATCGAGTCTCCTTTTACAGGTCCATATTTTGTTACGCTATCGACCGG
TGGTCTAACTACATCTCCTGTTTCTGGATTCTTAATTCCTGGTTTACCTGGAACTTCCTC
TTTCTCTCCTGTTGGTAACTTCGGATCAAATTCGTCTCGATGACCTGGTGTTATCGTTTC
TGGTCCGTATTCTGTTAATTCATTAATCGGATCTTTTGTGATTTCTTCTTTCGATTCACC
TTTACTAATAATTTCTCCAGTTAATGGATTTTTTAGTGTTGGCGTCGTTATTGTCTTCTC
ACCTTTTTGTCCTTCTCTTGTTACTTTTTCTGTCCCTGGTGCTAAATCAGGATTAAATTT
ACGTTCTTTCTTGAATGGAATTTCTTCTTTTTCTACAATCGAGTCTCCTTTTACAGGTCC
ATATTTTGTTACGCTATCGACCGGTGGTCTAACTACGTCTCCTGTTTCTGGATTCTTAAT
TCCTGGTTTACCTGGAACTTCCTCTTTCTCTCCTGTTGGTAACTTCGGATCAAATTCGTC
TCGATGACCTGGTGTTATCGTTTCTGGTCCGTATTCTGTTAATTCATTAATCGGATCTTT
TGTGATTTCTTCTTTCGATTCACCTTTACTAATAATTTCTCCAGTTAATGGATTTTTTAG
TGTTGGCGTCGTTATTGTCTTCTCACCTTTTTGTCCTTCTCTTGTTACTTTTTCTGTCCC
TGGTGCTAAATCAGGATTAAATTTACGTTCTTTCTCGAATGGAATCTCTTCTTTTTCTAC
AATCGAGTCTCCTTTTACAGGTCCATATTTTGTTACGCTATCGACCGGTGGTCTAACTAC
ATCTCCTGTTTCTGGATTCTTAATTCCTGGTTTACCTGGAACTTCCTCTTTCTCTCCTGT
TGGTAACTTCGGATCAAATTCGTCTCGATGACCTGGTGTTATCGTTTCTGGTCCGTATTC
TGTTAATTCATTAATCGGATC
LOCUS 47 HF6
GATCCAATTGAATTTTTCTCATTTACAACATAATCTGGATATTGAATGTTAGCAGTTGTT
TTTGTTGTAGTATTACCTATCGTAACATTAAACTCAACATCGTTTTTACTAACAGGAATT
GTATCAGCATCCATATAAATTGAATAATTAATTCCCATTTGTACAGAATTAAATCGATCA
ACATAATCTGTAAATGTATATGTAATTAAATTATTTGCAGTATCATGTTTTGCAGTCGCA
ATTGTTTCACCATTATTTGGATCTTTAATATCACCAATATTTTTAATATCTTCCGGATTC
AATCCATATACTTGTACTGTATCTGAGTATTTAATTGTGAAATAATCACCTGATTTAACT
TTGTCATCAACTGTAATTTGTGATTTTAATGATAAATAATCTTGGGCTGGTACGATTTTA
TTGTTTTTATCTGCATCAACGACAGTTAATGTTGTATTTGATGTGATTAAATCATTAACA
TTTTTAGCCTCTGTTGATGATGGCTGTACTGCTGCTATACGCATTCTTGTATTCAAACGT
TTAGGTGCTGTACTTTTTGGCAAAATGATATCTGCATTATTTTCATTATTTGAATTACTA
TTGTTATCAACAAGAGTTTCATCATTACTCTTGATAGCATCACTTTTAACATTTAATGTA
GTTGATTCAGTTTTGGCATCTACCTTTTTGTTTTCCTCATTAGTTGGTTGAACATTTACC
ACTGATTTATTCTCTTGCAAATCAGGTTGTAACGCTTCTTGATTACTTATAGTTTGTTTA
GTGTTTAAATCTTCATTCGTAGATTTTGGTGAAGCTTGCTCATCTGATTTGGCAGTTGAA
ACTTCAACTTTATTTCCAGTGGTAGATTGTACACTTTCTTTTTCTATTAATTTATTCCCA
TTTGAAGTCGTTTCATTACCTTGAGATGATACCATTTCTTTTTGATTATCATTTTTAGTA
TTGTCTTCTTGATTTAGTTGCTGCATATCAACTTTATCACTCGATTGATTATCACTTGCT
GAAGTTGTCGCTTCGTTCAATTCTTTATTAGTACTTTCTGCAGCCTTTGCTTCTTGGTTC
CCCAGACCAAAAATTAATGTTGTACCTACTAAAATTGATGCTGTTCCCACTGTGTACTTT
CTAATCGAAAATTTATTTAATCGATTGGATACCATGCCTTTCCTTGTTATTGCCGTTTTA
TTTTCTCTGTTTAGCATTAGATTACTCCTAATTCATCAAATTTTTAAATAATACAATTGT
TTTAAATACAAAAATGTATATCAATATAGTATTACATTTTTAGATAAAGCACAATACTTT

AATTATTTTTCTTTATCGTAAAACGTTATTTAACATTTGTGTTTAAATAAAAGTTTTTAT
GAGTTTTGTAATCTTTATTTAATCATCATAAAAAATAGTATTATTTGCCCTTGAAATTAA
TATCTTAGCTTTTCTAATTCATAGACAATTACATTTCTGTAACAAATTAAATTGTATCTA
TTCCTTAAAGATTTTTTGTTTTATATCTGGGAATTTCTAAACAGAAAAAACCAGGCCACA
TGGACCTGGTTAAGTTAATCATATTATTTATTTTGTTTTTTACGACGACCGAATAACAAT
AATGATCCTAATGCCGCGAATAATCCACCGAATAATGTGCCATTATTTGAATTATTATTT
TCACTACCTGTTTCTGGTAATGCTTTAGCTGTTTTATGCTGATCTTTAACCGTACTCATT
GGTTTAGCCGGAGTATGTTTACCTGCATCTGAATCTGAATCGCTATCTGAATCTGAGTCG
TTGTCTGAGTCCGAATCGCTATCTGAATCTGAGTCGCTGTCTGAATCTGAATCGCTATCC
GAGTCTGAGTCGCTATCTGAGTCTGAGTCGCTATCTGAATCTGAATCGCTGTCTGAGTCT
GAATCGCTATCTGAGTCTGAATCGCTGTCCGAATCTGAGTCGCTATCTGAATCTGAATCG
CTATCTGAATCTGAGTCGTTGTCTGAGTCCGAATCGCTATCTGAATCTGAGTCGCTATCT
GAGTCTGAGTCGCTATCTGAATCTGAGTCGCTGTCTGAATCTGAATCACTGTCTGAGTCT
GAGTCGCTGTCTGAGTCTGAATCGCTGTCAGAATCTGAGTCGCTATCTGAGTCTGAATCT
GAATCACTGTCTGAGTCCGAATCGCTATCTGAATCTGAATCGCTATCTGAGTCTGAGTCG
CTATCCGAATCTGAGTCGCTATCTGAGTCTGAGTCGCTATCCGAGTCTGAATCGCTGTCT
GAGTCTGAGTCGCTGTCTGAATCTGAATCGCTATCTGAGTCTGAGTCGCTGTCTGAATCG
CTGTCTGAATCTGAGTCGCTATCTGAATCTGAGTCGCTATCTGAGTCTGAATCGCTGTCA
GAATCTGAGTCGCTATCTGATGTTTCTT
LOCUS 49 (A) B13
TCTTTATTCGAACTATTAGATTCACTTTGACCAGTAGTCGTTCCATCAGATCCTTTGTCA
CTACCTGAAGCAGAATTTTTATCATCTTTACCTGGTGCATTAGCACCTGCTACATCAGTT
GGTCCATTAAATTTATATGTAATGTTGTAATGATGGTCATATTTGAATGGCTTTCCATTT
ACTTTTTCATCGATATAAACGTCAATTTTTCCATCTATTTTACCGTTCAACTTACTTACT
TCAAATTCAGAAGTGCGTTCATCTTTGGCAGTGTTTTTACTAATAATATTTTCTTTATGT
CCTTCGATACTCATTCCAGTAATCCAATGACTGTGGTTGACAGTTATTTGAACATACAAT
TTACCATTTTTCTTAATGTACTTTGCCGGTTTATTAAAATAGTCATTAGCAATTGACGTG
TCATTGGTATTGTATTTGTAAACCTCATAATTCAAAGTACCGCTATCTGCGGCATTTGCA
GAATTACTGAATGTCGCGATGATGATAATTAACGCTAAAATCGTTGTATTAAAAACTTTT
AAAATATTTTTCAAAACATAATCCTCCTTTTTATGATTGCTTTTAAGTCTTTAGTAAAAT
CATAAATAATAATGATTATCATTGTCAATATTTATTTTATAATCAATTTATTATTGTTAT
ACGAAAATAGATGTGCTAGTATAATTGATAACCATTATCAATTGCAATGGTTAATCATCT
CATATAACAACACATAATTTGTATCCTTAGGAGGAAAACAACATGACAAAACATTATTTA
AACAGTAAGTATCAATCAGAACAACGTTCATCAGCTATGAAAAAGATTACAATGGGTACA
GCATCTATCATTTTAGGTTCCCTTGTATACATAGGCGCAGACAGCCAACAAGTCAATGCG
GCAACAGAAGCTACGAACGCAACTAATAATCAAAGCACACAAGTTTCTCAAGCAACATCA
CAACCAATTAATTTCCAAGTGCAAAAAGATGGCTCTTCAGAGAAGTCACACATGGATGAC
TATATGCAACACCCTGGTAAAGTAATTAAACAAAATAATAAATATTATTTCCAAACCGTG
TTAAACAATGCATCATTCTGGAAAGAATACAAATTTTACAATGCAAACAATCAAGAATTA
GCAACAACTGTTGTTAACGATAATAAAAAAGCGGATACTAGAACAATCAATGTTGCAGTT
GAACCTGGATATAAGAGCTTAACTACTAAAGTACATATTGTCGTGCCACAAATTAATTAC
AATCATAGATATACTACGCATTTGGAATTTGAAAAAGCAATTCCTACATTAGCTGACGCA
GCAAAACCAAACAATGTTAAACCGGTTCAACCAAAACCAGCTCAACCTAAAACACCTACT
GAGCAAACTAAACCAGTTCAACCTAAAGTTGAAAAAGTTAAACCTACTGTAACTACAACA
AGCAAAGTTGAAGACAATCACTCTACTAAAGTTGTAAGTACTGACACAACAAAAGATCAA
LOCUS 49 (B) K16
AGATCAAACTAAAACACAAACTGCTCATACAGTTAAAACAGCACAAACTGCTCAAGAACA

AAATAAAGTTCAAACACCTGTTAAAGATGTTGCAACAGCGAAATCTGAAAGCAACAATCA
AGCTGTAAGTGATAATAAATCACAACAAACTAACAAAGTTACAAAACATAACGAAACGCC
TAAACAAGCATCTAAAGCTAAAGAATTACCAAAAACTGGTTTAACTTCAGTTGATAACTT
TATTAGCACAGTTGCCTTCGCAACACTTGCCCTTTTAGGTTCATTATCTTTATTACTTTT
CAAAAGAAAAGAATCTAAATAAATCATCGTCACACTCATAACTTAATATATTTTTTATTT
TAAATTTTATTTAACCTATGTCATAGATATTTCATAATCTATAACATAGGTTATTTTTTT
TATAAAATAACGTTGCAATTAACTAACATTTCAATGTACAATACAAGTAATCAATTGATA
ATGATTATCAGTTGATAATATACAATTAGGAGTTGTTTCTACAACATGAACAAACAGCAA
AAAGAATTTAAATCATTTTATTCAATTAGAAAGTCATCACTAGGCGTTGCATCTGTAGCA
ATTAGTACACTTTTATTATTAATGTCAAATGGCGAAGCACAAGCAGCAGCTGAAGAAACA
GGTGGTACAAATACAGAAGCACAACCAAAAACTGAAGCAGTTGCAAGTCCAACAACAACA
TCTGAAAAAGCTCCAGAAACTAAACCAGTAGCTAATGCTGTCTCAGTATCTAATAAAGAA
GTTGAGGCCCCTACTTCTGAAACAAAAGAAGCTAAAGAAGTTAAAGAAGTTAAAGCCCCT
AAGGAAACAAAAGAAGTTAAACCAGCAGCAAAAGCCACTAACAATACATATCCTATTTTG
AATCAGGAACTTAGAGAAGCGATTAAAAACCCTGCAATAAAAGACAAAGATCATAGCGCA
CCAAACTCTCGTCCAATTGATTTTGAAATGAAAAAGAAAGATGGAACTCAACAGTTTTAT
CATTATGCAAGTTCTGTTAAACCTGCTAGAGTTATTTTCACTGATTCAAAACCAGAAATT
GAATTAGGATTACAATCAGGTCAATTTTGGAGAAAATTTGAAGTTTATGAAGGTGACAAA
AAGTTGCCAATTAAATTAGTATCATACGATACTGTTAAAGATTATGCTTACATTCGCTTC
TCTGTATCAAACGGAACAAAAGCTGTTAAAATTGTTAGTTCAACACACTTCAATAACAAA
GAAGAAAAATACGATTACACATTAATGGAATTCGCACAACCAATTTATAACAGTGCAGAT
AAATTCAAAACTGAAGAAGATTATAAAGCTGAAAAATTATTAGCGCCATATAAAAAAGCG
AAAACACTAGAAAGACAAGTTTATGAATTAAATAAAATTCAAGATAAACTTCCTGAAAAA
TTAAAGGCTGAGTACAAGAAGAAATTAGAGGATACAAAGAAAGCTTTAGATGAGCAAGTG
AAATCAGCTATTACTGAATTCCAAAATGTACAACCAACAAATGAAAAAATGACTGATTTA
CAAGATACAAAATATGTTGTTTATGAAAGTGTTGAGAATAACGAATCTATGATGGATACT
TTTGTTAAACACCCTATTAAAACAGGTATGCTTAACGGCAAAAAATATATGGTCATGGAA
ACTACTAATGACGATTACTGGAAAGATTTCATGGTTGAAGGTCAACGTGTTAGAACTATA
AGCAAAGATGCTAAAAATAATACTAGAACAATTATTTTCCCATATGTTGAAGGTAAAACT
CTATATGATGCTATCGTTAAAGTTCACGTAAAAACGATTGATTATGATGGACAATACCAT
GTCAGAATCGTTGATAAAGAAGCATTTACAAAAGCCAATACCGATAAATCTAACAAAAAA
GAACAACAAGATAACTCAGCTAAGAAGGAAGCTACTCCAGCTACGCCTAGCAAACCAACA
CCATCACCTGTTGAAAAAGAATCACAAAAACAAGACAGCCAAAAAGATGACAATAAACAA
TTACCAAGTGTTGAAAAAGAAAATGACGCATCTAGTGAGTCAGGTAAAGACAAAACGCCT
GCTACAAAACCAACTAAAGGTGAAGTAGAATCAAGTAGTACAACTCCAACTAAGGTAGTA
TCTACGACTCAAAATGTTGCAAAACCAACAACTGCTTCATCAAAAACAACAAAAGATGTT
GTTCAAACTTCAGCAGGTTCTAGCGAAGCAAAAGATAGTGCTCCATTACAAAAAGCAAAC
ATTAAAAACACAAATGATGGACACACTCAAAGCCAAAACAATAAAAATACACAAGAAAAT
AAAGCAAAATCATTACCACAAACTGGTGAAGAATCAAATAAAGATATGACATTACCATTA
ATGGCATTATTAGCTTTAAGTAGCATCGTTGCATTCGTATTACCTAGAAAACGTAAAAAC
TAATAAATCGTCTTTATATTTAATTATTAAATTAACAAATTTTAATTGGCGGATGAGGTA
TCCAGTTACCTCGTTCGCCAATTATTTTTCGCAATATAAAAAGTCCCACTTAAAACAATC
ATTTTAAGCGGGACTTTTTATATTGAGTAACTAAAATTATTTAGCTGCTACTTCTTCGCC
ATTGTAAGAACCACAGTTTTTACATACACGGTGTGATAATTTGTATTCGACCACAGTTTG
GGCATTCAGTCATACCTGGTACTGAAATTTTGAAATGCGTACGACGTTTGTTTTTTCTAG
TTTTAGAAGTTCTTCTTTTTGGTACTGCCATGATATATCCTCCTTAGATTATAAACGAAA
AATACTAAATGTTAGTTTAATTAACAACATTATATCATTAATTAAACTACTTATTGCTCT
TTATCATATAATTGTTGTAATTTTTGAAGCCTTGGATCAACTTGTCGTGATTCTGAATCA
TCTTGTTGCTTGCTGTTTAGCAAGCTCATCTAATTGATCCTCATCGATTACTTCCCAACC
ATTACCTACTGTCAACATTTGGTCACTTTGCTCTGAATAAGCTCTCATTGGTTTCTCAAT
AATAACTATATCCTCGACAATATCCTGAAGATTAACCATACCATCTTTAATAATGTGATA
GTGTTCATCTACATCATCTTGATCATCGTTATACTGATTGTACCCTTCTAAATC

LOCUS 50 (A) GB2
GATCCAGCGGCTGCAGCGGTAGGAAACGGTGGTGCACCAGTTGCAATTACAGCGCCATAT
ACGCCAACAACTGATCCTAATGCCAATAATGCAGGACAAAATGCACCTAACGAAGTGCTG
TCATTTGATGACAATGGTATTAGACCAAGTACCAACCGTTCTGTGCCAACAGTAAACGTT
GTTAATAACTTGCCGGGCTTCACACTAATCAATGGTGGCAAAGTAGGGGTGTTTAGTCAT
GCAATGGTAAGAACGAGCATGTTTGATTCAGGAGATAATAAGAACTATCAAGCACAAGGA
AATGTAATTGCATTAGGTCGTATACATGGAACTGATACGAATGACCATGGCGATTTTAAT
GGTATCGAGAAAGCATTAACAGTAAATCCGAATTCTGAATTAATCTTTGAATTTAATACA
ATGACTACTAAAAACGGTCAAGGCGCAACAAATGTTATTATCAAAAATGCTGATACTAAT
GATACGATTGCTGAAAAGACTGTTGAAGGCGGTCCAACTTTGCGTTTATTTAAAGTACCT
GATAATGTGAGAAATCTCAAAATTCAATTTGTACCTAAAAATGACGCAATAACAGATGCG
CGTGGCATTTATCAACTAAAAGATGGTTACAAATACTATAGCTTTGTTGACTCTATCGGA
CTTCATTCTGGGTCACATGTTTTTGTTGAAAGACGAACAATGGATCCAACAGCAACAAAT
AATAAAGAGTTTACTGTAACAACATCATTAAAGAATAATGGTAATTCTGGTGCTTCTCTA
GATACAAATGACTTTGTATATCAAGTTCAATTACCTGAAGGTGTTGAATATGTGAACAAT
TCATTGACTAAAGATTTTCCAAGTAACAATTCAGGCGTTGATGTTAATGATATGAATGTT
ACATATGATGCAGCAAATCGTGTGATAACAATTAAAAGTACTGGAGGAGGTACAGCAAAC
TCTCCGGCACGACTTATGCCTGATAAAATACTCGATTTAAGATATAAATTACGTGTAAAT
AATGTGCCGACACCAAGAACAGTAACATTTAACGAGACATTAACGTATAAAACATATACA
CAAGATTTCATTAATTCAGCTGCAGAAAGTCATACTGTAAGTACAAATCCATATACTATC
GATATCATCATGAATAAAGATGCATTACAAGCCGAAGTTGACAGACGTATTCAACAAGCT
GATTATACATTTGCGTCATTAGATATCTTTAATGGTCTGAAACGACGCGCACAAACGATT
TTAGATGAAAATCGTAACAATGTACCATTAAATAAAAGAGTTTCTCAAGCATATATTGAT
TCATTAACTAATCAAATGCAACATACGTTAATTCGAAGTGTTGATGCTGAAAATGCAGTT
AATAAAAAAGTTGACCAAATGGAAGATTTAGTTAATCAAAATGATGAATTGACAGATGAA
GAAAAACAAGCAGCAATACAAGTTATCGAGGAACATAAAAATGAAATAATTGGTAATATT
GGTGACCAAACGACTGATGATGGCGTTACTAGAATCAAAGATCAAGGTATACAGACCTTA
AGTGGGGATACTGCAACACCGGTTGTTAAACCAAATGCTAAAAAAGCAATACGTGATAAA
GCAACGAAACAAAGGGAAATTATCAATGCAACACCAGATGCTACTGAAGACGAGATTCAA
GATGCACTAAATCAATTAGCTACGGATGAAACAGATGCTATTGATAATGTTACGAATGCT
ACTACAAATGCTGACGTTGAAACAGCTAAAAATAATGGCATCAATACTATTGGAGCAGTT
GTTCCTCAAGTAACTCATAAAAAAGCTGCAAGAGATGCAATTAACCAAGCAACAGCAACG
AAAAGACAACAAATAAATAGTAATAGAGAAGCAACTCAGGAAGAGAAAAATGCAGCATTG
AACGAATTAACTCAAGCAACCAACCATGCTTTAGAACAAATCAATCAAGCAACAACAAAT
GCTAATGTTGATAACGCCAAAGGAGATGGTCTAAATGCCATTAATCCAATTGCTCCTGTA
ACTGTTGTTAAGCAAGCTGCAAGGGATGCCGTATCACATGATGCACAACAACATATCGCA
GAGATCAATGCTAATCCTGATGCGACTCAAGAAGAAAGACAAGCAGCAATTGACAAAGTG
AATGCTGCTGTAACTGCAGCAAACACAAACATTTTAAACGCTAATACCAATGCTGATGTT
GAACAAGTAAAGACAAATGCGATTCAAGGAATACAAGCAATTACACCAGCTACAAAAGTA
AAAACAGATGCAAAAAATGCCATCGATAAAAGTGCGGAAACGCAACATAATACGATATTT
AATAATAATGATGCGACGCTCGAAGAACAACAAGCAGCACAACAATTACTTGATCAAGCT
GTAGCCACAGCGAAGCAAAATATTAATGCAGCAGATACGAATCAAGAAGTTGCACAAGCA
AAAGATCAGGGCACACAAAATATAGTAGTGATTCAACCGGCAACACAAGTTAAAACGGAT
ACTCGCAATGTTGTAAATGATAAAGCGCGAGAGGCGATAACAAATATCAATGCTACAACT
GGCGCGACTCGAGAAGAGAAACAAGAAGCGATAAATCGTGTCAATACACTTAAAAATAGA
GCATTAACTGATATTGGTGTGACGTCTACTACTGCGATGGTCAATAGTATTAGAGACGAT
GCAGTCAATCAAATCGGCGCAGTTCAACCGCATGTAACGAAGAAACAAACTGCTACAGGT
GTATTAAATGATTTAGCAACTGCTAAAAAGCAAGAAATTAATCAAAACACAAATGCAACA
ACTGAAGAAAAGCAAGTGGCTTTAAATCAAGTGGATC
LOCUS 50 (B) G10

GATCCAGCGGCTGCAGCGGTAGGAAACGGTGGTGCACCAGTTGCAATTACAGCGCCATAT
ACGCCAACAACTGATCCTAATGCCAATAATGCAGGACAAAATGCACCTAACGAAGTGCTG
TCATTTGATGACAATGGTATTAGACCAAGTACCAACCGTTCTGTGCCAACAGTAAACGTT
GTTAATAACTTGCCGGGCTTCACACTAATCAATGGTGGCAAAGTAGGGGTGTTTAGTCAT
GCAATGGTAAGAACGAGCATGTTTGATTCAGGAGATAATAAGAACTATCAAGCACAAGGA
AATGTAATTGCATTAGGTCGTATACATGGAACTGATACGAATGACCATGGCGATTTTAAT
GGTATCGAGAAAGCATTAACAGTAAATCCGAATTCTGAATTAATCTTTGAATTTAATACA
ATGACTACTAAAAACGGTCAAGGCGCAACAAATGTTATTATCAAAAATGCTGATACTAAT
GATACGATTGCTGAAAAGACTGTTGAAGGCGGTCCAACTTTGCGTTTATTTAAAGTACCT
GATAATGTGAGAAATCTCAAAATTCAATTTGTACCTAAAAATGACGCAATAACAGATGCG
CGTGGCATTTATCAACTAAAAGATGGTTACAAATACTATAGCTTTGTTGACTCTATCGGA
CTTCATTCTGGGTCACATGTTTTTGTTGAAAGACGAACAATGGATCCAACAGCAACAAAT
AATAAAGAGTTTACTGTAACAACATCATTAAAGAATAATGGTAATTCTGGTGCTTCTCTA
GATACAAATGACTTTGTATATCAAGTTCAATTACCTGAAGGTGTTGAATATGTGAACAAT
TCATTGACTAAAGATTTTCCAAGTAACAATTCAGGCGTTGATGTTAATGATATGAATGTT
ACATATGATGCAGCAAATCGTGTGATAACAATTAAAAGTACTGGAGGAGGTACAGCAAAC
TCTCCGGCACGACTTATGCCTGATAAAATACTCGATTTAAGATATAAATTACGTGTAAAT
AATGTGCCGACACCAAGAACAGTAACATTTAACGAGACATTAACGTATAAAACATATACA
CAAGATTTCATTAATTCAGCTGCAGAAAGTCATACTGTAAGTACAAATCCATATACTATC
GATATCATCATGAATAAAGATGCATTACAAGCCGAAGTTGACAGACGTATTCAACAAGCT
GATTATACATTTGCGTCATTAGATATCTTTAATGGTCTGAAACGACGCGCACAAACGATT
TTAGATGAAAATCGTAACAATGTACCATTAAATAAAAGAGTTTCTCAAGCATATATTGAT
TCATTAACTAATCAAATGCAACATACGTTAATTCGAAGTGTTGATGCTGAAAATGCAGTT
AATAAAAAAGTTGACCAAATGGAAGATTTAGTTAATCAAAATGATGAATTGACAGATGAA
GAAAAACAAGCAGCAATACAAGTTATCGAGGAACATAAAAATGAAATAATTGGTAATATT
GGTGACCAAACGACTGATGATGGCGTTACTAGAATCAAAGATCAAGGTATACAGACCTTA
AGTGGGGATACTGCAACACCGGTTGTTAAACCAAATGCTAAAAAAGCAATACGTGATAAA
GCAACGAAACAAAGGGAAATTATCAATGCAACACCAGATGCTACTGAAGACGAGATTCAA
GATGCACTAAATCAATTAGCTACGGATGAAACAGATGCTATTGATAATGTTACGAATGCT
ACTACAAATGCTGACGTTGAAACAGCTAAAAATAATGGCATCAATACTATTGGAGCAGTT
GTTCCTCAAGTAACTCATAAAAAAGCTGCAAGAGATGCAATTAACCAAGCAACAGCAACG
AAAAGACAACAAATAAATAGTAATAGAGAAGCAACTCAGGAAGAGAAAAATGCAGCATTG
AACGAATTAACTCAAGCAACCAACCATGCTTTAGAACAAATCAATCAAGCAACAACAAAT
GCTAATGTTGATAACGCCAAAGGAGATGGTCTAAATGCCATTAATCCAATTGCTCCTGTA
ACTGTTGTTAAGCAAGCTGCAAGGGATGCCGTATCACATGATGCACAACAACATATCGCA
GAGATCAATGCTAATCCTGATGCGACTCAAGAAGAAAGACAAGCAGCAATTGACAAAGTG
AATGCTGCTGTAACTGCAGCAAACACAAACATTTTAAACGCTAATACCAATGCTGATGTT
GAACAAGTAAAGACAAATGCGATTCAAGGAATACAAGCAATTACACCAGCTACAAAAGTA
AAAACAGATGCAAAAAATGCCATCGATAAAAGTGCGGAAACGCAACATAATACGATATTT
AATAATAATGATGCGACGCTCGAAGAACAACAAGCAGCACAACAATTACTTGATCAAGCT
GTAGCCACAGCGAAGCAAAATATTAATGCAGCAGATACGAATCAAGAAGTTGCACAAGCA
AAAGATCAGGGCACACAAAATATAGTAGTGATTCAACCGGCAACACAAGTTAAAACGGAT
ACTCGCAATGTTGTAAATGATAAAGCGCGAGAGGCGATAACAAATATCAATGCTACAACT
GGCGCGACTCGAGAAGAGAAACAAGAAGCGATAAATCGTGTCAATACACTTAAAAATAGA
GCATTAACTGATATTGGTGTGACGTCTACTACTGCGATGGTCAATAGTATTAGAGACGAT
GCAGTCAATCAAATCGGCGCAGTTCAACCGCATGTAACGAAGAAACAAACTGCTACAGGT
GTATTAAATGATTTAGCAACTGCTAAAAAGCAAGAAATTAATCAAAACACAAATGCAACA
ACTGAAGAAAAGCAAGTGGCTTTAAATCAAGTGGATC
LOCUS 51 (GC8)
GATCCACTGATGCTAGACGAATCACTTGTAGACATTGAGTCGCTTTCTGATGCACTGATG
CTCATAGAGTCAAATTGACTATTACTTGTTGAGCTTGACTGCGAATCGCTCACACTTGTT

GACGTTGATTCTGATCCACTCATACTTTGCGAGCTACTCAATGATTTTGAATCACTTAAT
GAATCCGAAGTGCTAAGACTTGTGGAACCACTTAAAGATATTGATCCACTTAATGAGTCG
GAGTCACTTGTACTAGTAGAATCACTCATTGATATTGAATCACTTAGCGAGGTAGACTCG
CTTACGCTTTCTGAACCACTTAATGATGTTGAGGTACTCAATGAACCAGATGTACTTGTT
GAAGTCGAACCACTTGTTGATTTTGAATCACTTAATGAATCAGATTCACTCACGCTTTCT
GAACTTCTTAGTGACGTCGATACACTTAATGATGACGAATCGCTTGTGCTTACTGAATCG
CTCATCGATTGTGAGCAACTCAATGAACTTGACTCGCTTACACTTTCTGATTTTCTTAAT
GACGTTGAGACGCTCAATGAGCCAGAATCACTGACACTTGTTGAGCCACTCATCGATTTA
GAGTCACTTTCAGAATTAGATTCACTTACACTTTCTGAATCATTTACAGATTCTGACATA
CTTTGTGAATCAGATATGCTTGCGCTCATTACTTCACTAGCCGATGTTGATGTACTTGTC
GAATCACTTAACGATATAGACACACTCATCGAACCAGATGTACTCGCACTTGTTGAGTCT
GATGTTGAATCACTAACACTATCAGATAATGACGTTGAATCACTCATACTTGTTGATGTA
CTTGTCGAAAGCGACATACTTTGTGAATCACTAGTACTTGTACGCATCGAAGTACTAGTT
GAAGCTGATGTACTACGAGAGTCACTTGTTGATGTTGATGTACTTGCTGATCCTGATGCA
CTTGTACTTCTTGATGTGCTTTGTGAATCGCTTAATGATGTTGATGTTGAATCGGATTCA
CTTGTACTTTCTGATGTTGAGCCAGACTCTGATGTACTTACCGATGTAGATAAACTTGCA
ATGGTCGACATGCGGTTTGAAGTTGATGTACTTAGCGAATCACTTAATGATGCTGATGTG
CTTTGTGAATCGGATTCA

LOCUS 52 (E1)

CAGGATTCGTTTTATCTAACTCTTCCCCAAAAGCTGATAAGTGTTGTGTAGTTTGTGTTG
TCATTACAGTAACTAAGATTGCTGTACCTATAGAGCCTGCTAATTGACGCATCGTATTTA
AGAAAGCATTACCATGAGAGGCAAGTCGTCCCGGTAACGCATTAATAGCTGCAGTTACCA
TTGGCATCATTATAAATGCCATACCAAATGAACGAAGTACATAGATACCCATGATTGTCA
TATATGGTGTATCCATATTTAATTTAGTTAATTCCCATGTTGCATAAGTCATTACAGCAA
TACCAAAGATAGCTAATGGTTTTAAACCAATAGTATCTAACAATTTACCTGCAAATGGTC
CTAGTAGACCCATAATTAGAGAACCAGGTAATAATAACAATCCGGAATCTAATGCTGAGA
ATCCGCGTAAATTTTGTAAATAAATCGGTAATAAAATCATACCACCATATAAACTTAACA
TTACAACCATATTAATAATTGTTGTTAATGTAAATGTTGGGAATTTCAATACTTCTAAAT
TCAACATTGGTGATTTCATTCTTAATTCTCTAATAACGAATAGAATAATAAAGATAATAC
CAATCGCAAACATTGTTTCTATCTCTACTGAACCCCAACCTTTGTTGCCAGCTTCTGAGA
AACCATATAACAAAGCACCAAAACCAATCGTACTAAAAATGATACCTGGGATATCAGCTT
TAGGGTTTGTTGTATATTGATATAACTTAAACCATACAAAACCAATTAAAATAGCGATAA
TCCCGATAATGAACATACCGTAAAACATCACATTCCAATGGTAATTTTGTACAATATAAC
CTGATAATGTTGGACCAATTGCAGGTGCTAAAATCATTGCGATACCCATTGTACCCATGG
CAGCACCACGTTTTTCAGGTGGATAAATTGTAATAATAACAATTGAACCTAATGGCATTA
GTACACCTGCACCAATGGCTTGTAATACACGTCCAACCATCATGATTGGGAAATTCATTG
AAATCGCACAGATTAATGAACCAATTGTAAAGAGTACTAACGCAACTAAAAATAATTTTC
GATATGAATATTTATTAAATAGATACGCCGTAATTGGTATTAAAATACCGTTTACTAACA
TGAATCCCGTCATCAACCATTGCCCTGTTGACGCAGAAATATTAAATTCCGTATTAATTT
TTGGTAAAGCAACATTTAATAATGTTTGGTTTAAAATCGCAATAAACATACCGAATAATA
ATGCCGCTAATATTTTACCGCGTGAAACACCTTCACCAAAAATAAAGTTTTTATGTTCTT
TTTTTATTTTTTCATTCACTTTATATTCTTCTGATTCAGGATTTTTAGCAGCAACTGCTT
CCTCATCCTTATTATTAGTGAATGCTTCTTGATCTTTCTCAGACCCCTTTGTGTAACCAT
TTAGACTAACTTGGCTATGATCATCTTGATTGTCAACACGCAACTCTTCATGCGTCATAC
GTTGTGTCGATTGATCAGTTGTTTTGTCTAAATCACTAGCTTTAAATTTAGATTGATTTG
ATTGACGTGTCGTAAATTGTTGTTCCTTTTGTTGGCGTTTGCCTTTTTTTCTTGATCTTA
TTAAAAATAAATTGATAACCCCAACAATAATGAGCGCTAAAATAATGTAGCTAATAATGA
AGGTCGTAGTCATTTAATGACCCCCTTAATTTTTATGGATTTTTACTTCAGCGTTCATTC
CAGGAACAACTTGTTTAGACGGTTCTGATTCTAGAGTGATTTTAACAGGTATTACTTGAG
AAACTTTAGTGTAGTTACCATCACTATTTGATGATGGCATTAATGAAAAGCTTGCAGCAG
TTGCTTTTCCAATACTATCAACTTTACCTTTAATAGAAGCTTTTTGACCGTCAATAGTCA
CATCAACATCTTTACCTACTTCAACATCTTTAATATCTTTTTCGTCAATATTTGCTGTTA

CATATAAATCATCTAAATTGTATGCATAAGCGATTGGGTTACCAGCTTGCACCATTGAAC
CTTCCATACCATCTAATTTGGCAATTGTACCTTTTTGAGGCATT
LOCUS 53 (E20)
CATACTTCTATGTCTGGTTCTTGATTTAATAGCTCATAAATATCAAATGCTGGTGATTCT
CTTATATCATCAACATCACCTTTATAAGTTAAACCAAATACTGTGACTTTATTCCCGCTC
AACACTTTGATGATTTGCTTCGTTGTATCAACAACATAGGCCGGCATTGAATTATTAATT
TCACGTCCAGTTTGAATTAACTTTGCATTTTCAGGGTCTTTAGCAATAATAAAGTACGGA
TCAACAGCTAAACAATGACCGCCTACACCTGGACCAGGCTGATGGATGTTAACACGCGGA
TGTTTGTTTGCCATTTCAATCACATCTAATACATTAATATTTAAGTTATTGCAAATTTTT
GTTAATTCATTAGCTAAAGCAATGTTCACGTCTCTATATGTGTTTTCCATTAGCTTACTC
ATTTCAGCAGTACGTGCATCTGTTTCAATCATTTCTCCCTGAACGAATGTGCGATAGACA
CGTTTACCCGCTTCAATACAAGCTTCAGTCACACCGCCAATGATACGATTGTTATGAACT
AATTCTTCTAAAATTTTTCCTGGCAGTACACGTTCTGGACAATGCACTAAATAAATATCT
TCACCTATTGTAAACCCTAAATTTTCAATGACTGGTTTTACAAAATCATCCATCGTTTTA
GGCGCAATTGTCGACTCTACAATAATGGTATTTCCTTTTTCTAAAAATGATAAAATACTA
TCTAATGCACGCATAACTAGCGAAATGTCACATGACCGGTACTGATCATCATTATTCGGC
GTCGGAACGGCAATGATAAAAACATCAGATGCATCTGGCGTTGTAGATACCTTCAATTTT
CCCGATGACAGTACCTCTTCATAAACCTCTTGTAATCCAGGTTCTTCAATACTAATTTGA
CCACTTTGTAACTTATCAATCGTTTGCTGATTAATATCAACACCAAGCACATCGACGCCA
TGTTTTGCAAACATAATTGATGTTGGTAAACCAATATAACCTAAGCCAACTACTGTTAAC
TTCATACTATAACCTCCAAATAAAACGATTTGTATGTTGATTTTATTTAATAGATGACTT
ATGCCTTATCTTTGGTTGTCGTTTCATCCATGATGTCCGCAATAACAAGTGACATTTTTC
CAGGAATAATTTCAAGTGCATTATTATTTTCATATAACGTATTGCTGTATATTAAATTGC
CGAATAATTTTCTAAAGACCGACAACTTATTAAAATACTTATTTAGCATTGAAGGCATGT
TGATCAATACCGTTTTACGATGTGATTGGCGACGTATTTCATACATTACTGACGATGTAT
CAAAGTAAAAACTATCTTGAGGATGGTACACACCTGTCACTTCTAATGATATTAATTGAT
CAATAAATGCTGTCAGATGTTTAATATATAATGCACTGCGCTGATTGTTAATATTGGGAA
TGATTGGCAATCGCTTTGACAATTGCATTAACCGTTGGAAATTTCCTGGGCAATGTGCAC
CATAAATCATTGGTGGTCTCACAATTGCTACTTTAAACGAATCACTAATCAATTCTTGTA
ATGCTTGTTCAGCGAACTTTTTGGAAATACCATAGTTGGTCGTAGGGTTCATTGGTGTTT
GTGTATCAACTTGATCTGATTTACCAACATGACCTTCTTTTCCATAAACTGCCATAGTAC
TCATAAAAATAAATTGTTTAACGTCTTCAGCTTTAGCCTTTTGTGCCAATTGTTTCGTCA
GCAACATATTCACTTGCATATAATCAGATAGCCTTGCTTGAGGTGAATTGTTGTGAACCA
AAGCTGCTGTATGAATTAAAACATCATAATCTTTGAACGAGGTCGACTTCCATAATTGAT
TCCTAACATTAATTTGATCTACTTGATGTCCTTGTTCAATAAGCTTATCTTTTAAAGCAT
TACCGATATATCCATGTACGCCTGTAATTAAAATATTTTTTCTCATTAGTGATGCACACC
TTCTGAAGTAACGATATTTTTAATTGTTTTATATATGATATACATATCAAGCATCATAGA
TTGATGTGTTAAGTAATAATGATCATACGCTACTTTTTGATCATCAGTGATATCATCTCT
CCCCATCACTTGAGCTAGTCCTGTCACACCTGGTCTAATCGTATGCACGTTCGCTTTTGT
ACGTTTTTCGATTAATTCGTATTGATTATAAAGCGCTGGTCTAGGACCTACAATTGACAT
TTCTCCTTTTAAAACATTCAATAATTGTGGCAATTCATCAATAGAGGTCTTACGAATGAC
CTTCCCTGTCTTTGTTATATACGATGTTGAATCCATTAAATCAGTTGCAACATTAGGTGT
GTCTATTTTCATTGATCTAAACTTATAAATATTAAACAATTCATTATTAATCGTCGGTCT
TTTTTGTTTGAAAATGGCTGGTCCAGGTGATTCCATTTTAATTAGTAATGCTGTAATTAA
CAGAATCGGACTTAAAACTACTAAACCATATATTGAACTCACTACATCGAATAATCGCTT
CATAATTATCTCCTCACTTCAACAGATTGTAATACTTCATAGTATTAATTT
LOCUS 54 (E105)
CAGTAATTAATAAAATTTTGTCATCGAACATAATTATCTCCCTTTTTGCCATTGGCATAG
TTAATAATTTTTTCTTTACTAAAGTCATTGACGATGTCTTGAATAATCGCTTCAACTTCA

TTACATTTCATATGTTGTACTTTGCCACGATAAATTTTTTCAAATACTTGTTCAGGATGA
ACCTCATCTTTATTCATAAGCTCTTCAAACATTTTTTCGCCGGGTCTAATCCCTGTATAA
GTAATGCGTATGTCGTCTTCTTTTTTACCACTTAGCTTAATTAAATTACGTGCCAAATCT
ACAATTTTCACTGGTTCTCCCATATCTAGCACAAATACTTCGCCACCTTCTGCTAATGCC
CCTGCCTGCAAAACTAGTCTAGAAGCTTCAGGAATTGTCATAAAGTAACGTGTCATTTCA
GGATGTGTCACAGTAACTGGCCCACCTTCTTCAATTTGACTTTTGAAAAGTGGAATCACA
GATCCTCTCGATCCAAGTACATTACCAAATCTCACTGCAACAAAATTTGTTCGATGCGTT
TCATCATTTAAACTTTGAATAATCATTTCTGCAATTCGCTTTGAAGCTCCCATGACATTA
GGCGGATTAACGGCTTTATCCGTAGAAATCATAACGAATTTCTTTACCTCTGCATTTTTA
GCAGCTTCAGCAGTATTTTTCGTACCTAAAATATTATTACGTACTGCTTCTTCAGGGTTG
TCTTCCATTAACGGCACGTGCTTGTGTGCTGCTGCATGATAAACTGCGTATGGTTTATAC
GTTTCCATAATTTCAAACATACGCGCTCTATTTTGCACATCCGCTATAATAGGAACGATA
TCAACATTTTTTCCGAAGCGATTTCGCAATTCACGATTGATTAAATAAATACTGTTTTCA
CCATGGCCAAGTAGAATAATACGTTCTGGATAGAAATTACAAACTTGTCTACAAATTTCT
GATCCTATTGAACCACCTGCACCCGTAACTAAAATAGTTTTATTCGTCAATTCATTTGAT
ATCATATCCATATCTAATTCAACAGGATCTCTGCCTAGTAAATCTTCTACTTCAACTTTT
TTAAGTTGGTTCACTTCTAACTCACCAGACATGACGTCTTCTATATTTGGCATTTTCAAT
AACTCAACGCCATCCATATGGCAAATATTATTAATTTCTTTCAAACGCTCTTGACCAATA
GTTGGAATTGCAATGATGATTTTTTTAATCTTATATTTCCTCACTAGTTCTGGAATATCC
GCAATTTTACCTTGGACTTTTACACCCTCAGTAATTGTGATATTGCGTTTATGTTCGTCA
TCATCGACTGCTAATACCGGTTCAAGTTTCATTTCGTCACTTTTCAACATTTGTCTAATC
AGCATTGAACCTGCTTGACCAGCACCAACAACTAAAGTTGGCTTCTTATTAAATGACTTA
CCTCCAAGGTATTTCCGATAAATACGCCAAAATAACCTTGAGCCACCTATTAAAATCAAG
TGCATCATCCAAGTAATTAAATACAATCTAAAAAACGGTCTATTGCCTGTAACAATTGTC
ACGACCACCATCGTAATAACGATAGATGTCGTCACAGCTTTAACAATTAAAATCAATTCA
CTCACACTGGCATATTCCCACGCTCGATGATACATATTAAAAATAAATGCTGAAATATGA
TGCGATATGAATAGTGATATAGCTGCCAATATTAATAATTTGACAGAATATGTTTTGAAA
TACGGTTCTAAAATGTAATAACTTACGAATACTGAAAATGTCACTATCAGTGAATCGATT
AATGCTAGTATTAAAAGCCGCAATTTCACAGATAAATGTGCCATAAAACCCCTCATTTGC
TGTTTATAACCCAAACCATCTTTTCTGTTTATAATCTTGTTGTGGCATTCGTTTAGGAAT
TTTTTTATCATCAACAACTAACTTCGCATTACTAATAAATCCGTTCATATCTTCATAATA
ATCACGTAATTTCTTATCATTAAATAAGTCTTTCATTAAGAACGGTCTGATTTCTGTGTT
ATGCGCATCTGAACCGATGAAATGTGTCAGATTGTTTTCAATCATTTGAATTGCTAATTT
TCTAATTTTTTTACCGGAAATACCCGCTAATGACGCCGTTGTCACTTGACTTAAAGCACC
TTTGTTAATTAAATCGTATAGTATGTCAAGGTTTTGACTTATTGCTTTATTCCGCTCTGG
ATGTGCAATAATCGGTACAAAGCCTTTACTCTGTAATTCGAAAAATAATTGATC

LOCUS 55 (E18)

ATCAAAAAGTTATGATGAACGTTTTACGCCGGATGAAGTAGTCGCATACCAACAACATCA
AGGTAATAAATTTAAAGAACATTTTGATTTGAATTGTTATCTGACACTGCTAGATGTATT
GGATAGTCACAACATTGACCGAGGTCGCACAGACGTAACGCATGTTTTTAAAAATTTAGA
AACAAAAGTGTTAACGATGGGGTTCATAGATGATTTGCTATATCCGGATGATC

LOCUS 56 (F5)

AACATACAGGTAAAGTTTTACTTGTAACTGAAGATAATTTAGAAGGTAGTATTATGTCAG
AAGTGTCAGCGATTATTGCAGAGCATTGCTTGTTCGATTTAGATGCACCAATCATGCGTT
TAGCTGCTCCAGATGTACCATCTATGCCATTTTCTCCTGTATTAGAAAATGAAATTATGA
TGAATCCAGAAAAAATCTTAAATAAAATGCGTGAATTAGCAGAATTCTAGGGAGGGAAAG
TCATGGAAATAACAATGCCTAAGTTAGGTGAGAGTGTTCATGAAGGCACCATTGAACAAT
GGTTAGTTTCTGTTGGTGATCATATTGATGAATATGAACCATTATGTGAAGTTATTACAG

ATAAAGTGACAGCTGAAGTCCCTTCCACGATATCAGGAACAATTACAGAAATTTTAGTTG
AAGCGGGGCAGACAGTAGCTATTGATACAATTATCTGTAAAATTGAAACTGCTGATGAAA
AGACAAATGAAACAACTGAAGAGATACAAGCAAAAGTGGATGAGCATACTCAGAAATCTA
CTAAAAAAGCTAGTGCAACAGTGGAACAGACATCTACTGCTAAACAAAATCAACCACGTA
ATAATGGTCGCTTTTCACCTGTTGTATTTAAACTCGCTTCAGAGCATGACATTGATTTAT
CACAAGTTGTAGGTAGTGGATTTGAAGGTCGTGTAACTAAGAAGGATATAATGTCAGTTA
TTGAAAATGGTGGTACCACAGCTCAATCTGACAAACAAGTTCAAACAAAATCAACATCAG
TAGATACATCAAGTAACCAATCATCTGAAGACAATAGTGAAAACAGCACAATACCAGTAA
ATGGTGTGCGTAAAGCAATTGCGCAAAATATGGTTAATAGTGTAACAGAGATTCCACATG
CATGGATGATGATTGAAGTAGATGCTACAAATCTTGTGAATACGAGAAATCATTATAAAA
ACAGCTTTAAAAATAAAGAAGGATATAATCTAACGTTCTTTGCTTTCTTTGTAAAAGCTG
TAGCAGATGCTTTAAAAGCATATCCTTTATTAAATAGTAGCTGGCAAGGAAATGAAATTG
TCTTACATAAAGACATTAATATTTCAATTGCTGTTGCTGATGAAAATAAATTATACGTAC
CTGTGATTAAGCATGCAGACGAAAAGTCAATCAAAGGTATAGCTAGAGAAATTAATACTT
TAGCAACGAAAGCGCGTAATAAGCAATTGACAGCTGAAGATATGCAGGGCGGTACATTTA
CGGTAAATAATACTGGTACATTTGGTTCAGTATCATCAATGGGTATTATAAATCATCCAC
AAGCAGCGATTTTACAAGTAGAATCAATCGTTAAAAAGCCAGTAGTAATTAATGATATGA
TTGCAATTCGTAACATGGTTAATTTATGTATTTCAATTGATCATCGTATTTTAGATGGTT
TACAAACAGGTAAATTTATGAATCATATTAAACAGCGTATCGAACAGTATACTTTAGAAA
ATACAAATATATATTAGTGATAACATAGATGCATCTATCGACAACTTGTTTTATCTTGTT
CTTGTCGATGGATGTATTATTTTTTGGCACTAAAATATGTGCAATATATTCAAAAAAGAT
AAAGAACAATAATCAACATGGTTGAATGCATTTTTGCAGTAAAGTCAAAATAAGACATCA
TACTTGAAACATATTAATGAAAACATGTGAACAAATTAGTTACCATGATTTTAAGCACAA
TAATGTTTGGTATATTGTTAAAATTGTGTCTAAATATAGGTGTGATTCAGATTAGTTTAT
TGAACAATATGTTATTAATTAGTAGAATGAGGATAGTTTAAATATAAAGGGATAGGTGAT
TGAACTTATGGACATGAATTTCGATTTATACATGAACGGTGTTGTAGAACAAGCAAGGAA
TGAAATTGAATCTGCGGGATATGAGCAATTAACTACTGCAGAAGATGTTGACAAAGTTCT
TAAACAAGATGGTACAACACTAGTTATGATCAATTCTGTATGTGGTTGTGCAGGTGGTAT
CGCAAGACCAGCAGCATCACATGCTTTACATTATGACGTATTACCTGATCGTCTAGTGAC
AGTATTTGCTGGACAAGATAAAGAAGCGACACAAAGAGCGCGTGAATACTTCGAAGGTTA
TGCGCCTTCAAGTCCGTCATTTGCATTAGTAAAAGATGGAAAGATTACAGAAATGATTGA
AAGACATCAAATCGAAGGTCATGATGTGATGAACGTAATTAATCAATTACAAACATTATT
CAATAAATATTGTGAAGAAAGATAAGAGGCGCTAACCCATGTTAAAGTTAAATCCTTACA
AGATTGGATTTAGAACAATAAAAACAGCAGTGGGTATGACTTTAGGTGTAATTATTAGTA
AGCTGTTAGGTTTAGATAATTATGCTTCAAGCGCCATATTAGTCGTATTATGTATTAAAC
ATACAAAAGTACATTCGCTACAAGCGATTATTTCAAGATTAGTATCATGTTTTTTAGTAT
TGTTTTTAGGTTCAGCAATATTTAGTTTATTAGGTCAGAGTCCAATTGTACTCGGTATTA
TCGTATTGTTATTTATACCATTAACTGTCGTATTAAAAGTACAAGAAGGTGTCATTACGA
GTTGCGTTATATTACTTCATGTTTTTAATGCAAAATCAATTGATGCACATTTAATTGTTA
ATGAAACATTATTACTGTTAATTGGACTAAGCATTGCATTTACAATGAATTTAATGATGC
CAAGTTTAGACAAACAACTAGACGAATACAAATGTAAAATTGAGCAACAAATTGCTGATA
TTTTTAGTAAATATAGTTATATTTGTGAAAAATATGAAGATACCATTGCGATTGAATTTG
AAGTGTTACTTTTAAATATTAAAAAGGCGAAGTCTATCGCGTTCCGAGATGTTAAAAATC
ATTTTGTTAGAAACGAAAATTCATACTATCATTATTTTGATATGCGAGAAGAGCAAGTGG
AATTGTTAATGAGAATGAAACCGCTCATCGAAAGTATCTGTCATAAAGATCC
LOCUS 57 (F3)
GATCTTCGCGTCTTAATGGATGCCATATACGAACTGAATGACCACCAAGATTTGCGTGAG
ATTACTAAAGATTCGAAAATGCAAAAACTCGCATTAGCAGGATTCCTTAAAAAGATAAAA
GGTACGTACATTGAGTCATTATTAAAAGAACACAAATTGTTATAACGAAAACCATTAATA
GATTTTTATTTGGTGATTTCAAATCATGAGACTGGGACAGAAATGATGTTTTCATAAAAA
TTATTTCGTTGTTCCACTCTCATGATTTTTTTGATGAAACATAATTACATGATTGATTGC

ATCATTTTGTTAAACAAGTGATTGCAAACCTGCCATTTCACACTGAAAATTTACATAATA
AGTGACGATATTTTACAAGTCATATACAAATAACATATATTGTTAAATAATTTTACCTAA
TCTTAACATTAAATTTACAATTATAAGCGATAATCTAAATATAAAGCTTATTTGAGGTGA
AATAATGGAAATGTCGGTTACAGAAGTCATTTTCTCCTTTTTAGGTGGTTTAGGTATTTT
CCTTTACGGCTTAAAAATCATGGGAGACGGGCTTCAAGCATCAGCAGGAGACAGGCTACG
AGATATTTTAAACAAATTTACATCAAATCCAGTATTAGGTGTTATTGCAGGTATCGTTGT
AACTATTTTAATACAAAGTAGTTCAGGTACGACAGTTATCACAATCGGACTGGTAACAGC
TGGATTTATGACATTGAAACAAGCCATTGGAGTGATAATGGGTGCTAATATCGGAACAAC
GGTAACTGCATTTATTATCGGTATAGATTTAGGCGAATATGCAATGCCAATTTTAGCATT
AGGTGCATTCTTAATCTTTTTCTTTAAACGCTCTAAAATCAATAACATTGGCCGCATACT
ATTCGGTTTCGGTTCACTATTCTTCGGTCTAGAATTTATGGGTGATGCCGTTAAACCTTT
AGCATCATTAGATGGATTTAAGCAATTAATGCTTGATATGTCTACAAATCCAATACTCGC
TGTCATTGTCGGCGCAGGGTTAACAGCACTAGTTCAAAGTTCAAGTGCGACGATTGGTAT
TTTACAAGAATTTTATCAACAAGATTTAATTAGCTTAAACGCAGCAATCCCTGTGTTACT
AGGCGATAACATTGGTACCACGATTACAGCTATCTTAGCTAGTTTAGCCGGCTCAATCGC
TGCAAAACGTGCGGCGCTTGTACACGTCATCTTTAACTTAATCGGGGTAATTATCTTCAC
AATTTTCTTGCCAGTTGTGATTCATTTGATTAGTTTGTTACAAGATTTATGGCACTTAAA
ACCAGCGATGACGATTGCAGTATCACATGGTATCTTCAACATAACAAATACTTTGATTCA
ATTACCATTTGTAGCAGGTTTAGCATGGATTGTTACAAAGCTTGTCCCAGGTAAAGATAT
TGCTGATGACTATAAACCTCAGCACTTA
LOCUS 58 (G8)
GATCCAAAATCACTTGTTTGATTGGTTTATTCTTATTAGACTGTTGATGAATTCGATTTA
AATAATACGTCAATGCTTCATTTGAAAAAGGTTCAGGCGCTATTTCTAAAAATGAAGGAT
AAGATGCTACAGACGCAACATTTCTAATTTCTCCAAAACGACGTATATCTGAATAAATTA
ACTTTTTGTCATTTGACAACTCAAAAATAACATGCCAATGCTTACGATAATTAGGTATCA
TAATATCTTCAAGTTCATCTACAATGAAAAAACCGCCCGCCATACCTAAATGACTAATTA
ATGTACGTTGTTCTCGTTTATTATCTAGCTGAAAAACGATATATTTACTTCTTCGTTCTA
CATTTGTAATGGTATAGCCTTCCGATAAAGTTTTAAAAGTATCTAATTCAATTCCTTTTA
TAATTGTTTCCTTGCCTTGAGCTTTACCTTCGATTACTTTATCCGAAAATATAACGTGTT
CAATTTTTTGATTTATAACGTAGGGTTCAATTCCTCTTTTTACATGTTCTACTTCTGGTA
ATTCGGGCATACCATTAACCTCACTTTATTTTGCATCATACCAGGTTGCACCATAACTTG
AGTCTACTTTTAATGGAACATCTAATTGCAATGCATTTTCCATTATCTCTTCTACAAATT
CACTAAATGAATCTACTTCTGACTTAGGTACTTCAAAAATTAATTCATCGT
LOCUS 59 (G23)
CTTGTAATTCTTGTTGGTTAAAATATGGATGTACCTCAATTTGATTCACCATTGGTTTGA
TACTTGATTGAGCCATTAATTTTTCTAGATGATGAACATTAAAATTACATACACCTATTG
CTTTTACCTTACCTTGCTCGTAAAGTTCTTCCATAGCTTTATATGTTTCTAAAAATAGAC
CATCTGCTTCACAAGGCCAATGTATTAGAAATAAATCAAGATAATCAGTTTGTAAATTTT
CAATCGATTTGTTGAAATATTCGAATGTTTTCTCATAACCTTGATAGTCATTCCATAACT
TCGTTGTTATAAACAAATCTTCTCTATCGACGCCATTATCCTTTAATGCTCGTCCTAGTG
AAGCCTCATTATCATAAAAGTATGCTGTATCAAACGCTCTATAGCCTGCGTCAATTGCAG
CATTTACAACTTTAGTCATATCTTCGTCAGAGATTTTATAAACACCTAACCCAACTGAAG
GCATCGGGTATCCATTATTTAATATTTGTATCTCATTCAACATCTTTATATCTCTCCAAT
CTATGTATCTTTTATATCTTTACATTACCCTAAATTTTTCAACAAACTCAATTAATACGA
ATTATCGCTTTCAATAAAAATTATTCATTAAATCATTAAAGATATTGAGTTCCAATACTA
TTTTCACTTTTCATTAATTTTAGTCAAAAAAATAACCAACCAAAAATGAATTAAATCATT
CTTAGTTGGTTTATATATTAATATCTATTCTGATTTTTCATCTTCATCAGACTGTCCGAT
AGTAGGTCTCGCTTCATTAAATTCATAGTTTAATATCACCCAAATAATTTGGTGGTTATC

GATTTCTGAAACAACCCAGCGATCATAAGTTGTATCCACGTAATCATCTTTTTGTAAATT
GGTATTACGAGATTGTAACCATCCACCTATCGTATCAATATCCTCAGAGTCATCAAATTC
TATACCGAACTCTTCAGTTAAATCATCCAATAGTACTCTGCCATTTACTTGGAATGTCTT
ATTATCAATTTTAACGATATCATTCACTTCATCATCATCAAATTCATCACGAATTTCTCC
AACGATTTCTTCTAAAATATCTTCCATCGTTAAAATACCTGCCGTTCCACCATATTCATC
TATAATAAGACTCATATGTACATGTTCACGTTGCATTCTAATTAATGCATCACTGATACG
TGTTGTCTCTGAAATCATTGGCAACTCATGTATATAGTTTGCTATTTTAATCGTTTTTCC
AGAAGCGTATTCAGTTAAAAATTCTTTGACGTTAATAAATCCTTTAATGTGGTCTTTATC
ACCATCATCAGTAATTGGATAACGCGTAAATTGATGTTCTTTTATTGTTTCTAGTAATTC
GTCTACATTAAAAGGTTCATTTAGTGTAATCATTTGAGTTCTAGGTACCATTATATCTTT
TGCATGTCTTTCATCGAATGAAAAGATATTTTGCATATATGCCAATTCAGTTTGGTTGAT
TTCTCCACCATTATAACTATTGTTAATAATAATTTTGATTTCTTCTTCTGACATTGCATC
AGTTTGGGCATCAGGATTTACACCAAACATTCTAATAATAACACGTGCAGAACCATTCAT
CAGCCAAATCAATGGTTTCATAATGTTACCGAAATAGAACAATGGTCTTGCATATACTAA
AGCAAGCTTTTCAGTATGTTGAATAGCTATAGATTTAGGCGCTAATTCACCAAGTACTAC
ATGCAAATACGTAACGATTATAAATGACACTGCAAACGAAATCGTCGTCGTTAATGCAGT
TGGTAAATTGATTGCTTCAAATATTGGGTGTAATAGCTTTTCAAACGTTGGTTCACCAAG
CCAACCTAACCCTAAAGATGTTACTGTTATACCTAACTGACAAGCAGAAAGATAATAATC
TAGATTAGCAATCATCTTTTTTACTATTTTAGCAGGTTTATTTCCTTCATCTGCTAGCTG
TTCAATTCTTGTTGCTCTAATTTTTACTAATGCAAATTCTGAACCAACAAATACAGTGGT
TAATGCAATTAATAGAATAAATATAATCAAACTAATTATGGTCGAAGTTTCCAATTAATT
CCCTATTTCTAGGGATTCACCTCCATGTTATATGTGTCACTCATGGGTAACACGCATTCA
AATTTATCACTATGACTTAAATTACAACTACATGTTATCGCCTTCCCATTTAGACACCCC
CAGAAAAAAATGTTATTGCTTCTATTTTATCATAATATAAAGTGCTTATGTTAACAGATT
AAATCTATTGCATACATTTAATTATGATTAT
LOCUS 60 (G29)
TCTTCTGAGAAGGTTTTTGACCCATTTGCATCATCATCATACGAAGCATTTCTTCGTTGA
TTGGTGGGTTTTTCTTCAAGTAGTCCATCATATATTTTCTAGCTAAAAGGAAACCTCCAA
TTAAACCTAAAATTAATGCAGCTACTATAAAAATAATTGCTACCCAAGTTGCCATTGTTT
CACCCGCTTTCTTTATCCTACTGAATTTTGCTAAATTCATCACATTATTTCAAGAACTAG
TTTATTCAAGTATTTTAATATCGATACTAAAAATAATATCAAAAATCATGCTGTTATAAC
AGAGCTTTTAAAGATTAATCTGAAATAGTATACTTTCATAACTTATCACTTATGATGTAG
TTTAAGTGCTATACTCTAAATTTCAACACTTTAAAAAAAGCCTAAGATTATGCATCCTAG
ACTTCTAAACATACTCGCTTTATAAATTATTCTTATAAGCTCATAACTTGGTTTAAGATA
TTTTCTTTTGTAAATCCATATTTTTCAACTACTAAATCGCCAGGTGCACTTGCGCCAAAG
CCGTCAATAGCAATAACTTTACCTGCAGTACCTACATATTTATGCCATCCAAGCGGTGAA
GCCATTTCAATCGCAACACGTTTTGTTACGCTTGATGGAATAACTGATTCTTTATATTCT
TCAGATTGTTGTTCAAATGCATTCCAGTTAGGCATTGAAACAACACGTACTGATTTACCT
TGTTTTTCAAGATCTTTAGCAGCTTCAACTGCAAGACTAACTTCTGAACCTGAAGCTAAT
AATAGGAATTCTGGTGTCTCTTCAGAGCCATAAACTGTATAGGCACCTTTTCGAACGCCT
TCTTCAACTACATCTTCTGGTACATCTAATACCGGTAAGTTTTGACGTGTCAATACTAAT
GAAGTAGGTGTAGATTCAGATTCTAAGGCAACTTCCCATGCTACTCTTGTTTCATTACCA
TCAGCAGGACGGATAACATTCATATTTGGAATGGCTCTTAATCCAGCTAATTGCTCAATT
GGTTCATGAGTAGGACCATCTTCACCTACTGCAATTGAATCATGTGTGAAGATGAACGTT
GCATTTAATCCCATAATTGATGATAAACGTAACGCTGGTTTTAAATAATCACTAAATACG
AAGAATGTTGCACCATATGGATGTAAACCTCCATGTGCAGCCATACCATTTACAGCAGCA
CCCATAGCAAATTCACGTACACCAAACCACACATTTTTACCTTCAGGTGTTTCAGAACTA
TAATCAGTTGCATCATTTACATTGGATTTGTTTGAACCAGCAAGGTCTGCTGATCCACCA
AAGAATGAAGGGACAGTTTTACTGATTGCTTGAATAACAGTACCAGAATCAGCACGAGAT
GCACCATTATGACCCAGTTCAAAACGTGGTAATTCATCCTTATAATTTTTAGGCAATTTA
CCACTAATCGCTAATTTAAATTCTTCTGCTAATTCAGGATATGTTTCTGCATATTTTTCT

AATAATGAATTCCATTGAGATTCATCTTCATTAGCACGTTTTAACATAGTATTTTGGAAA
ATTTCGTATACCTCTTCTGAAACATTAAAACGTTTTTCAGGATCTAAACCGTAATTTTCG
AATGTTAATTTTCTTTCAACTTCACCTAAAGGTGCCCCATGAACACCATTAGTTCCTGCT
TTATTCGGTGAACCAAATCCGATTGTTGTTTTAACTTCAATAATCGTTGGTCCTTCTTGA
GATTTAGCTGTAGTAATCGCTTTATCAATTTCTTCTAAATCATTACCATCTTTAACTAGT
AAGTAATTCCAACCATATGCTTCAAAACGAGCTTTTGTGTTTTCAGAAAAAGCTTTGTTT
AATTCGCCATCTAATGAAATATCATTTGAATCGTATAAAACAACTAATTTACTTAATTTA
TTATGTCCAGCAAATGAAGCTGCTTCATGCGATATACCTTCCATTAAATCACCGTCAGAA
GCTAATACATATGTGTAATGATCTACAACATTATATCCTTCTTTATTAAATTTCCCTGCT
AGGTGATCTTCTGCTAAAGCTAATCCTACTGACATAGCAAAACCTTGTCCAAGTGGTCCG
GTAGTAACTTCTACACCATCTGTATGTCTGTATTCAGGATGACCTGGTGTTTTAGAACCC
CATTGTCTAAATTGCTTTAATTCTTCTAATTCTAAACTACCAGAAACATGTAACAAGCTA
TACAATAATGCTGAACCATGCCCTGCAGATAATACGAAACGGTCTCTATTGAAGTAATCT
TTAGATTGTGGATTAAAATTCAGATGACGTGTCCACAAAGTGTAAGCCATTGGGGCAGCT
CCCATAGGTAATCCTGGATGACCAGAATTCGCTTTTTCGATTGTGTCGATACTTAGTGCA
CGTAGCGTATCAACAGCTAATTGATC
LOCUS 61A (HA7)
GATCTAGGTATGGATAAAGACGAAGCCAAAAAGTTATTCGCCAAATCTGAAAGTATTTTC
AAAGACCTTAAAGGCGTAAAATACAAAGTAGACTATAAAGATAAAAAAGCAATTGAACAC
TTAGACATAGATTACACAGAAGTTGACATGAAAAAATTAAATAAACGTCTTGGTGTTTCG
ACTAAAGAAAATAAAGATATTAGTTTTGAAAAACTTGAAAAGCAATTAAAGCACAGAGGT
TTAAAAGAAAAAGATAAAATGGACGACAAATAGTTTATAACTTAAAAATGCCCTCAGATA
AGACTAAGGTTACAAACCTTAATTCATATTCTGAGGGCTTTAATATTTGAAGTTCTTGTG
TGACCAGCATCCACTACTAATATAAAATTATTTGCAGTAACGCTAAAATCCGCTGCTTTC
AATTTCCCGAAATAATTAAGTTAACTAATGAGTTTTAATTTATAATCATGTATCGTTTGT
AACTCACCATCGACTTTTCGATATACAATATGATCAGCAGTAATTTCTGTAGGACTGGAT
ACGCCAACAGCTGCTGCAATATTGAATAAGCCTTCATGCAAACTTGTTACATAGTTTGTG
ACACGATATTGCTTTTCTCCAACAATCAATGCTTTTTCTTTCTTCGCATCTGTCGTTGCA
ACACCTACAGGACACGTATTCATGTGACATTGTTGACTCATTATACAACCGACACTAATC
ATCATCCCACGTGCGATATTTACAAAATCTGCACCTAAACCTAGTGCAATCGCAATTTTA
TCTGGTGTCACTAACTTACCAGATGCCGCCAATTTCACTTTATCTCGAATACCATATTTT
TCTAACATGCCAGACACAATAGGTAGAGCTGTAAATAGCGGTAAGCCAACACCATCTTGT
AATTCTTGGAATGTTGCACCAGTACCACCTTCACCACCATCAATCGTAATAAAGCTTGGA
TACTTATCTAGTTCCACCATCGTACGTACAAGTGTTTCAATTTCTGAAACTTTGCTTACT
ACAATTTTGAATCCTACTGGTTTTTGACCTAATTGCTGCAACTGATC
LOCUS 61B (G28)
AGGTATGGATAAAGACGAAGCCAAAAAGTTATTCGCCAAATCTGAAAGTATTTTCAAAGA
CCTTAAAGGCGTAAAATACAAAGTAGACTATAAAGATAAAAAAGCAATTGAACACTTAGA
CATAGATTACACAGAAGTTGACATGAAAAAATTAAATAAACGTCTTGGTGTTTCGACTAA
AGAAAATAAAGATATTAGTTTTGAAAAACTTGAAAAGCAATTAAAGCACAGAGGTTTAAA
AGAAAAAGATAAAATGGACGACAAATAGTTTATAACTTAAAAATGCCCTCAGATAAGACT
AAGGTTACAAACCTTAATTCATATTCTGAGGGCTTTAATATTTGAAGTTCTTGTGTGACC
AGCATCCACTACTAATATAAAATTATTTGCAGTAACGCTAAAATCCGCTGCTTTCAATTT
CCCGAAATAATTAAGTTAACTAATGAGTTTTAATTTATAATCATGTATCGTTTGTAACTC
ACCATCGACTTTTCGATATACAATATGATCAGCAGTAATTTCTGTAGGACTGGATACGCC
AACAGCTGCTGCAATATTGAATAAGCCTTCATGCAAACTTGTTACATAGTTTGTGACACG
ATATTGCTTTTCTCCAACAATCAATGCTTTTTCTTTCTTCGCATCTGTCGTTGCAACACC
TACAGGACACGTATTCATGTGACATTGTTGACTCATTATACAACCGACACTAATCATCAT
CCCACGTGCGATATTTACAAAATCTGCACCTAAACCTAGTGCAATCGCAATTTTATCTGG
TGTCACTAACTTACCAGATGCCGCCAATTTCACTTTATCTCGAATACCATATTTTTCTAA

CATGCCAGACACAATAGGTAGAGCTGTAAATAGCGGTAAGCCAACACCATCTTGTAATTC
TTGGAATGTTGCACCAGTACCACCTTCACCACCATCAATCGTAATAAAGCTTGGATACTT
ATCTAGTTCCACCATCGTACGTACAAGTGTTTCAATTTCTGAAACTTTGCTTACTACAAT
TTTGAATCCTACTGGTTTTTGACCTAATTGCTGCAACTGATCGACGAAACGAATCAAATC
TTCAGCATTATGAATAAATTCGTAACGGTTAGGTGAATTGATTGTTTTATAAGGTTCAAC
ATTTCGGATTTTAGCAATTTCTTCGTTTACCTTTTCAGCTTCCATATGACCACCACGAGT
CTTAGCACCTTGTGCCAACTTCAGCTCAAATGCGCGTACGTTAGATAACTGTGCAACCTC
TTTAAATAAACCTTCACTAAAATTACCTTCTTTATCACGAACACCAAATAAACCGGGACC
AATTTGGAAAATGATATCCCCATTACCTTTTAAATGATATTCTGATAAGCCACCTTCACC
TGTATTCATCCAAGTGCCCGCTTTAGCTAGACCTTTAGATAAAGCTGTAATGGCATTTTT
TCCTAAAGCGCCATAACTCATACCAGATTGTCCTACGATACGTTTTAAAATAAATGGATG
TTTTAAATGTTCACCTAATTTTATTGCATGGTCATCACTTAAGTAATACGGATCAATCTT
TGTCGGCACACGATATTCTTCACGACTAAATAAACGCTCATTCGCGATTTTATAAATGAA
TGTTGATAACAATGTTGTATTATCTACTGAAATCTCATTACGTTGCATCGGAAACATTGT
GTTCTGTATGTAAAAGCCGTCTTGATAATCTTTAGTAGTACCGAAGCTGGTCATACGAGA
GTTATATTTTCCAGCCAAAACGATATTTTTATAATCATTACGTGAAAAAGGTTTCCCTTC
ATTATCCCCAGAAAATAAATACTGACGTAATTCCGGTCCCATTTTTTCTGAAATATATCT
AATACGTGCTAGTAAAGGATAATTCCTTAATACACTATGTTGTGATTGTCTTTTATCTTT
AATTAACCAAATAAGCCCGATAACAATAACCGTAAGCATGAATCCTACAACGATAATGTT
AACTATAAATTGCATGACTGTAAGAAACGTCATTACAATACCTCCCCCCAAAATTTCAAT
TCAATATTTATGATACACCTTACAAAACAAAACACAATGGAAGCGCTTCATTTTATAAAA
CAATTTTATGATATGTTTTTCATTTTAAATTTTAATGTATAAAACATACAATACAAAGTA
ATATGTGCTAAAGTATCTATATAATACAACTATTTAAGAGGTATACTATGTCAAATACAA
ATAAACATTACATAGAAGAAGAATACGCTACCGAACAATCGCGTTTTTTCAAACGTGATA
TTGGATTTATTTTCCTTTACATATTTTTGGTTAACATCTTGCCGATC
LOCUS 62 (H3)
GATCCTTTTGTTGTAGACGTAATACGTTCTTGTAATTGTCCCATTTCAGTAGCAAGTGTT
GGTTGGTAACCTACTGCAGAAGGCATACGACCTAATAATGCAGATACCTCAGAACCAGCT
TGTGTAAATCTGAAAATGTTATCGATGAATAATAATACGTCTTGACCTTGTTCGTCACGG
AAATATTCAGCCATTGTTAAACCAGATAATGCAACACGCATACGTGCACCAGGTGGCTCA
TTCATTTGCCCGAATACCATGGCTGTTTTCTTAATTACACCACTGTCACTCATTTCGAAG
TATAAATCGTTACCTTCACGAGTACGTTCACCTACACCGGCGAATACAGAAATACCACCG
TGCTCTTGAGCGATGTTGTTAATTAATTCTTGGATTAATACTGTTTTACCTACACCGGCA
CCACCGAACAATCCGATTTTACCACCTTTAATATAAGGTGCTAGTAAATCTACTACTTTA
ATACCTGTTTCTAAAATTTGAACTTCTGTTGAAAGTTCATCGAATGCTGGTGCTTGACGA
TGGATAGGATCGCGGCGAACAGAATCACTAATTTCTTCTTTAAGGTCAATTGTTTCACCT
AGTACATTAAATACACGACCTAATGTTTCGTCACCAACAGGTACACTAATTTCTTTGCCT
GTATCTTTTACATCCATGCCTCTTTGGACACCATCAGTTGAATCCATCGCAATTGTACGA
ACAACGTCGTCACCTAATTGCAGCGCAACTTCTAATGTTAGTTGTATTGTACCTTCTTCT
TTAGGCACATCAATAACCAAGGCGTTATTAATTTTAGGAACTTCGTTATGTTCAAATCGA
ACATCAATTACAGGACCCATAACTTGAGTTACACGGCCAATTCCCATGCTATTTTCCTCC
TTTAAATATTATTCAAGCGCTGCGGAACCACCAACAATTTCAGTAATTTGTTGCGTAATT
TCTGCTTGTCTCGCTCTGTTATATTCTAATGATAAGTCATCAATAAGTTCAGTTGCATTA
TCAGTGGCATTTTTCATCGCAGTCATACGTGTTGCATGCTCACTTGCTTTTGCGTCTAAT
ATTGTTCCGTAAATCAAACTCTCAACATATTGAGGCAAGATTACACTTAAGATAGATTCT
TTATCTGGCTCAAATTCATAAGAAGACAAATGACCATGCCCCTTACTAGAATCCTCTTGA
GATAATGGTAATACTTGTCTAGATGTAGGCTTGTTTTCAAGAACGCTGACATAATGACTA
TAGTATATATTTAATTCATCAATTTCTTCTTCACTGTATAAGTCTATAGCATGGTTAGCT
AGTGCTTGAACAGATTTGAAAGAAGGTTGATC

LOCUS 63 (GD10)
GATCCTATTTTTAAACAAGAAGTAGAGAATCTTGAAAAAGAAATAAGAAATGTATAAGTA
GGAAACTTTGGGAAATGTAATCTGTTATATAACAGCACTAATGATAACAATCATTTTTTA
CATTTCTATATGCTAATGTGGCAAGATGAGCAAAACTCATTTTGTGGATAATGTTTAAAA
GTCATACACACCATACACAAGTTATCAACATGTGTATAACTTCGCCAAATCTATGTTTTT
AAGACTTATCCACCAATCCACAGCACCTACTACTATTACTAAGAACTTAAAACCTATATA
ATTATATATAAACGACTGGAAGGAGTTTTAATTAATGATGGAATTCACTATTAAAAGAGA
TTATTTTATTACACAATTAAATGACACATTAAAAGCTATTTCACCAAGAACAACATTACC
TATATTAACTGGTATCAAAATCGATGCGAAAGAACATGAAGTTATATTAACTGGTTCAGA
CTCTGAAATTTCAATAGAAATCACTATTCCTAAAACTGTAGATGGCGAAGATATTGTCAA
TATTTCAGAAACAGGCTCAGTAGTACTTCCTGGACGATTCTTTGTTGATATTATAAAAAA
ATTACCTGGTAAAGATGTTAAATTATCTACAAATGAACAATTCCAGACATTAATTACATC
AGGTCATTCTGAATTTAATTTAAGTGGCTTAGATCCAGATCAATATCCTTTATTACCTCA
AGTTTCTAGAGATGACGCAATTCAATTGTCGGTAAAAGTGCTTAAAAACGTGATTGCACA
AACAAATTTTGCAGTGTCCACCTCAGAAACACGCCCAGTACTAACTGGTGTGAACTGGCT
TATACAAGAAAATGAATTAATATGCACAGCGACTGACTCACACCGCTTGGCTGTAAGAAA
GTTGCAGTTAGAAGATGTTTCTGAAAACAAAAATGTCATCATTCCAGGTAAGGCTTTAGC
TGAATTAAATAAAATTATGTCTGACAATGAAGAAGACATTGATATCTTCTTTGCTTCAAA
CCAAGTTTTATTTAAAGTTGGAAATGTGAACTTTATTTCTCGATTATTAGAAGGACATTA
TCCTGATACAACACGTTTATTCCCTGAAAACTATGAAATTAAATTAAGTATAGACAATGG
GGAGTTTTATCA
LOCUS 64 (F5)
AACATACAGGTAAAGTTTTACTTGTAACTGAAGATAATTTAGAAGGTAGTATTATGTCAG
AAGTGTCAGCGATTATTGCAGAGCATTGCTTGTTCGATTTAGATGCACCAATCATGCGTT
TAGCTGCTCCAGATGTACCATCTATGCCATTTTCTCCTGTATTAGAAAATGAAATTATGA
TGAATCCAGAAAAAATCTTAAATAAAATGCGTGAATTAGCAGAATTCTAGGGAGGGAAAG
TCATGGAAATAACAATGCCTAAGTTAGGTGAGAGTGTTCATGAAGGCACCATTGAACAAT
GGTTAGTTTCTGTTGGTGATCATATTGATGAATATGAACCATTATGTGAAGTTATTACAG
ATAAAGTGACAGCTGAAGTCCCTTCCACGATATCAGGAACAATTACAGAAATTTTAGTTG
AAGCGGGGCAGACAGTAGCTATTGATACAATTATCTGTAAAATTGAAACTGCTGATGAAA
AGACAAATGAAACAACTGAAGAGATACAAGCAAAAGTGGATGAGCATACTCAGAAATCTA
CTAAAAAAGCTAGTGCAACAGTGGAACAGACATCTACTGCTAAACAAAATCAACCACGTA
ATAATGGTCGCTTTTCACCTGTTGTATTTAAACTCGCTTCAGAGCATGACATTGATTTAT
CACAAGTTGTAGGTAGTGGATTTGAAGGTCGTGTAACTAAGAAGGATATAATGTCAGTTA
TTGAAAATGGTGGTACCACAGCTCAATCTGACAAACAAGTTCAAACAAAATCAACATCAG
TAGATACATCAAGTAACCAATCATCTGAAGACAATAGTGAAAACAGCACAATACCAGTAA
ATGGTGTGCGTAAAGCAATTGCGCAAAATATGGTTAATAGTGTAACAGAGATTCCACATG
CATGGATGATGATTGAAGTAGATGCTACAAATCTTGTGAATACGAGAAATCATTATAAAA
ACAGCTTTAAAAATAAAGAAGGATATAATCTAACGTTCTTTGCTTTCTTTGTAAAAGCTG
TAGCAGATGCTTTAAAAGCATATCCTTTATTAAATAGTAGCTGGCAAGGAAATGAAATTG
TCTTACATAAAGACATTAATATTTCAATTGCTGTTGCTGATGAAAATAAATTATACGTAC
CTGTGATTAAGCATGCAGACGAAAAGTCAATCAAAGGTATAGCTAGAGAAATTAATACTT
TAGCAACGAAAGCGCGTAATAAGCAATTGACAGCTGAAGATATGCAGGGCGGTACATTTA
CGGTAAATAATACTGGTACATTTGGTTCAGTATCATCAATGGGTATTATAAATCATCCAC
AAGCAGCGATTTTACAAGTAGAATCAATCGTTAAAAAGCCAGTAGTAATTAATGATATGA
TTGCAATTCGTAACATGGTTAATTTATGTATTTCAATTGATCATCGTATTTTAGATGGTT
TACAAACAGGTAAATTTATGAATCATATTAAACAGCGTATCGAACAGTATACTTTAGAAA
ATACAAATATATATTAGTGATAACATAGATGCATCTATCGACAACTTGTTTTATCTTGTT
CTTGTCGATGGATGTATTATTTTTTGGCACTAAAATATGTGCAATATATTCAAAAAAGAT
AAAGAACAATAATCAACATGGTTGAATGCATTTTTGCAGTAAAGTCAAAATAAGACATCA
TACTTGAAACATATTAATGAAAACATGTGAACAAATTAGTTACCATGATTTTAAGCACAA

TAATGTTTGGTATATTGTTAAAATTGTGTCTAAATATAGGTGTGATTCAGATTAGTTTAT
TGAACAATATGTTATTAATTAGTAGAATGAGGATAGTTTAAATATAAAGGGATAGGTGAT
TGAACTTATGGACATGAATTTCGATTTATACATGAACGGTGTTGTAGAACAAGCAAGGAA
TGAAATTGAATCTGCGGGATATGAGCAATTAACTACTGCAGAAGATGTTGACAAAGTTCT
TAAACAAGATGGTACAACACTAGTTATGATCAATTCTGTATGTGGTTGTGCAGGTGGTAT
CGCAAGACCAGCAGCATCACATGCTTTACATTATGACGTATTACCTGATCGTCTAGTGAC
AGTATTTGCTGGACAAGATAAAGAAGCGACACAAAGAGCGCGTGAATACTTCGAAGGTTA
TGCGCCTTCAAGTCCGTCATTTGCATTAGTAAAAGATGGAAAGATTACAGAAATGATTGA
AAGACATCAAATCGAAGGTCATGATGTGATGAACGTAATTAATCAATTACAAACATTATT
CAATAAATATTGTGAAGAAAGATAAGAGGCGCTAACCCATGTTAAAGTTAAATCCTTACA
AGATTGGATTTAGAACAATAAAAACAGCAGTGGGTATGACTTTAGGTGTAATTATTAGTA
AGCTGTTAGGTTTAGATAATTATGCTTCAAGCGCCATATTAGTCGTATTATGTATTAAAC
ATACAAAAGTACATTCGCTACAAGCGATTATTTCAAGATTAGTATCATGTTTTTTAGTAT
TGTTTTTAGGTTCAGCAATATTTAGTTTATTAGGTCAGAGTCCAATTGTACTCGGTATTA
TCGTATTGTTATTTATACCATTAACTGTCGTATTAAAAGTACAAGAAGGTGTCATTACGA
GTTGCGTTATATTACTTCATGTTTTTAATGCAAAATCAATTGATGCACATTTAATTGTTA
ATGAAACATTATTACTGTTAATTGGACTAAGCATTGCATTTACAATGAATTTAATGATGC
CAAGTTTAGACAAACAACTAGACGAATACAAATGTAAAATTGAGCAACAAATTGCTGATA
TTTTTAGTAAATATAGTTATATTTGTGAAAAATATGAAGATACCATTGCGATTGAATTTG
AAGTGTTACTTTTAAATATTAAAAAGGCGAAGTCTATCGCGTTCCGAGATGTTAAAAATC
ATTTTGTTAGAAACGAAAATTCATACTATCATTATTTTGATATGCGAGAAGAGCAAGTGG
AATTGTTAATGAGAATGAAACCGCTCATCGAAAGTATCTGTCATAAAGATCC
LOCUS 65 (F110)
AACGACCACAAAACATACACAACTACATTTTCTCTAATTATTTATATAAATATTTTATCG
TTTAAAATTATATCATGATTCTCTACCATTATGTATAACTTATTTATATTTTTGCACAAG
ATATAATATTGTCCAACTTTAAATATCCAAACCTATTAATAATAAAACTAGATACCATCG
TACTCTATCATGGCTTTCTTATAATCGAGTAGAAGCATCATCATTACTTGATTATTTGCT
CTTTACAACACCGAGCGTGCCCGTACTCGGTAATTCAATACCTTGCGTAACCCGTCACTG
TGAGTTGGGTTAATGATAATAAAGCCCACACCTTTTAAAAAGATGTGGGTAATTTATATA
ATTTTTATTTACATTTTTAACTTATAAAAAAAAGCGCCTATGTCATGATTTACCATCACA
TAGGCGCTTATCAATAAATTATTACTTATTACTTTCCATTTCATCTAATTTATGCGGATT
TCCTGTAATTAGATGACAACTTATTCTTTTCAGGGGAACATTACACTTTTATAATATGTT
CAAAGACAAACTTAACCATTCACAAATATAAAGAATAATATTATCAAATCATTGAACAAA
TCGTATTTTGCAACAATTGATATTTATATTAATGTATTGCATTTAATTTATAAAATTCAT
ATACATCTTAATATTCTCAATATCGATTTGTATTGTCAACTTTATATAGATTTAAAAAAA
TAATCTCATGTCTTTTTTTACAAAAGTAAGTTAATTATTACAAACTAGTAACAAAAATTA
TTTCTTCAAAAATATATTTAGTAGCGAATACACTTCATCTTTGAATTGACTTTTACTTTC
TTCCACTGCTCCAAATTTTTGCGAAAAGGATGCTTTCAAATACCAACTTTCAAGAAACAG
CAATATTAAATTCTGAAAGTCTTCTTTTGTCATCTTTATCTTTGATTCATCATAGAATTT
TGCTATCTCTTTACTTAATGATTGATTTAAATCTTGTATTTGTCCGTAAATATTTCCAGA
AAATTCCTCAGGCGTATTAGATAATTGAACGTACATTCTAATATACCTTTCTTCGATGTC
GAAAATAAACTCAAATAAGAATTGATATAAAGCATCAATTGAATAGTTCGATTTATTTTG
ATTCATCATAATAATATTATTAAGGTAATCAAAACAACATTTAACACTTTGTTCGTAAAT
ACTTTTTTTCGAGTCAAAATGGTAATATAAACTCGCTTTCTTTATATTTACACTTTTAGC
TATATCATCAAGTGTTGTACCGTCATACCCCTTCTCTGAAAATAAGGTTATTGCGTTATC
AATAATCTTATCCTTCAATTTTTATAACCCCCTACTGAAAATTAATCACACTATGTTACA
GGAAAATTAAGTTGCAATTACAAATATTTCCGTTTAATTATAACAACAATCTATTGCAAA
TTAAAATACTATCAATTACCATATGGCTTACAACCTAACTAACGAAAGGTAGGTAAAGAA
ATTGCAATTTTTTAACTTTTTGCTTTTTTATCCTGTATTTATGTCTATTTACTGGATTGT
CGGTTCAATTTATTTCTATTTTACCAGAGAAATTAGATATTCATTGAACAAGAAGCCTGA
CATAAATGTGGATGAATTAGAAGGCATTACATTTTTACTTGCCTGTTATAACGAAAGTGA

AACGATTGAAGATACGTTGTCTAATGTTCTTGCACTCAAATACGAGAAGAAAGAAATTAT
TATCATTAATGATGGAAGTTCAGATAATACAGCAGAACTCATCTATAAAATCAAAGAAAA
TAATGACTTTATTTTCGTCGATTTACAAGAAAACAGAGGTAAAGCCAACGCACTCAATCA
AGGCATTAAACAGGCTTCATATGATTATGTAATGTGCTTGGATGCAGATACTATCGTTGA
TCAAGATGCACCATATTATATGATTGAGAATTTCAAACATGATCCAAAACTTGGTGCAGT
TACAGGTAATCCTAGAATTCGAAATAAGAGTTCTATTTTAGGTAAAATTCAAACGATAGA
ATATGCAAGTTTAATTGGCTGTATTAAGCGAAGTCAGACACTTGCTGGCGCAGTCAATAC
TATTTCGGGTGTCTTCACTCTATTTAAAAAAAGTGCAGTTGTCGACGTTGGCTACTGGGA
TACTGATATGATTACCGAAGATATTGCAGTTTCTTGGAAATTGCATTTACGTGGATATCG
TATTAAGTATGAACCGCTTGCCATGTGTTGGATGTTGGTTCCAGAAACATTGGGAGGTCT
TTGGAAGCAACGCGTGAGATGGGCTCAAGGGGGACACGAAGTATTACTACGAGACTTTTT
TAGCACAATGAAAACGAAAAGGTTTCCTTTATATATTTTGATGTTTGAGCAAATCATCTC
GATTTTATGGGTATATATAGTGCTTCTATATTTAGGCTATTTGTTCATAACAGCAAACTT
CTTAGACTATACATTTATGACATATAGTTTTTCAATATTTCTACTATCATCATTTACTAT
GACTTTTATAAACGTTATTCAATTTACAGTCGCACTCTTTATTGATAGTCGCTACGAGAA
AAAGAATATGGCTGGACTCATATTTGTAAGTTGGTATCCGACAGTATACTGGATTATTAA
CGCAGCAGTAGTTCTTGTCGCATTTCCAAAAGCATTAAAACGTAAGAAAGGTGGTTACGC
AACATGGTCAAGCCCAGACAGAGGGAATACCCAACGCTAAAATCATCGCTAAATATTGTA
AGAGAAACAGCACTTATCGCTATATCTTGTGTCTTTTGGATATATTGTTTAGTTGTTCTA
CTCGTTTATATTGGTACTATATTTGAAATTCATGACGAAAGTATCAATACAATACGTGTT
GCTTTAAACATTGAAAATACTGAAATTTTAGATATATTTGAAACTATGGGCATTTTCGCG
ATTATCATTTTTGTATTTTTTACAATTAGCATATTGATTCAAAAATGGCAGAGAGGAAGA
GAATCGTGAAGTATAGAAAATTTATAATTTTAGTGTTGAGTATCTTGATCATATTGCCTG
TAAGCACACTGGATGGTCATCATATTGCAAATGCAGATGACGATTCACCTAAAAAACTGA
AATATAAAGAAAATAGTGCTCTGGCATTAAATTATCACCGTGTAAGAAAAGCGAATTTTC
TGAATAATTTTATTTACTTCTTTTCTAGTAGTAAAGAAATTAAAAATTATAGTGTTAGTC
AATCACAATTTGAATCTCAAATAAAATGGCTAAAATCACATGATGCTAAATTTTTAACCT
TGAAAGAATTTTTATATTACAAGAAAAAAGGTAAGTTTCCAAAACGAAGTGTATGGATTA
ACTTTGATGATATGGATGAAACTATTTATGAAAATGCTTATCCAATCTTAAAAAAATATA
AAATACCGGCAACTGGGTTTATTATCACAGGTCATGTTGGGGAAGAAAACTTTCACAACC
TCGATATGATTAGTAAAAAAGAACTAAAAGAAATGTATAAAACTGGGTTATGGGAATTTG
AAACACATACCCACGATTTGCATAACTTATCTAAAAATAATAAGTCAAAATTAATGAAAG
CTTCTGAAGCTACAATCATAAAAGATTTAAACAAAAGTGAAAAATATCTAACTAAAAACT
TTAAAAAGTCGCAGAAAACTATAGCCTATCCTTATGGCTTGATGAATGACGATAAATTAC
CGGTAATCAAAAAAGCTGGGTTAAAATACGGTTTTTCATTAGAGGAAAAAGCAGTCACTC
CGAACTCCAATGATTATTACATCCCTAGAATATTAATTAGTGATGATGCTTTTGAGCATT
TAATTAAGAGATGGGACGGATTCCATGAAAAAGATTAGACTTGAACTCGTATATTTACGT
GCTATTATATGTGCAATTATTATTATCACACATTTACTTACACAAATTACTTTAAAACAT
GAAAATATGGAGGGTGGATCCTTAGTGTTACAATTTTACATTCGTAATATTGTGATTTTT
GGTACACCTTGCTTTATTATCTTGTCACAGTTACTGACAACCTTGAATTACCAAAAAGTC
ACCTATAGATACTTAACTACACGCGTAAAATATATACTTATTCCTTACATATTAATGGGA
TTGTTTTACAGTTATAGTGAATCATTATTAACAGATTCAAGTTTCAATAAACAATTCATT
GAAAATGTCCTATTAGGTCAATGGTATGGCTATTTTATCGTTGTTATCATGCAATTCTTT
ATTTTGAGTTATATCATTTTTAAAATTAACTATAACCTATTCAACAGTAAAATATTATTA
TTGTTATCTTTTATTTTACAGCAATCATTTTTATATTACTTTACGAACAACACAGCGTTT
CACGATACCGTGCTACACTATTATCCATTAAGTGAAAATACTATAATATTCGGATGGATT
TTTTATTTCTTCTTAGGTGCATATATGGGTTATAACTACGAACGTGTATTAAATTTCTTA
GAACGTTATTTAGTTATTATGATTGTATTAGCTGTAGCTACTTATTTTGTGTTTATTGCG
TTAGCAAATGGAGACTATTGGAACGTTACCAGCTTTTCATATTCATTAACACCATATAAT
AGTATTATGTTTATTGTTATCTTGGGTATTTGCACGCATTTTAAAACAATGTTATTTAAT
ACGATTCAAATGATTAGTGCTTTCTCATTCTTTATTTATTTATTACATCCAATCATTCTA
GACTCATTGTTTGCATATACAAATATATTTGAGGATAATACAATGGTCTTTCTAGCGATA
TCACTACTATTCATTTTAGGATTATGTATAGGTGTCGGCATGATATTGCGTGAATTCTAT
ATCTTTAGGTTTATTATTGGAAAACAACCATATAAATTGAACATTAATGCTTATTAATTA

TTAAGCTATGTTAAAAACACGCGGTGGGCGAAATCAGTTTGAATTGACTGACTTCGTTTT
ACCGCGTGTTTAATATTGTTATACATATATTCTAATTGCACATTTAAACTTCGTAAATGC
CAATGGGAGTGGGACAGAAATGATATTTTCGCAAAATTTATTTCGTCGTCCCACCCCAAC
TTGCACATTATTGTAACCTGACTTTCCGCCAGCTTCTATGTTGGGGCCCCGCCAACTTGC
ACATTATTGTAAGCTGACTTTCCGCCAGCTTCTTTGTTGGGGCCCCGCCAACTTGCATTG
TTTGTAGAATTTCTTTTCGAAATTCTTTATGTTGGGGCCTCGCCAATGTTTTACTTGAAT
AATTCTTTTAGAATTCTAAATAATGATCCGATTAATTGAAAGAAGTCTGCAGTCATTATT
AATTCCTCCCTTTACTTTATAAATTATGCTTGCTTAGTATCAGTCAGCTTTTCAGTTTTC
ACTAAATCGTCTGCTAAATGATGCCAAAAATCTTGTAATTCTTCTCTTGTGCGCACTGTA
TCAGAACTGTCTTGTCCTACAAAGTCAACATGATCCCAATCATGTTTTGTAGGCGTCACT
TGCCAAATGCCTTTTTGAATTTTATCTGTCGCTTTTGTATAAGCTTGATTAAATGGATGT
TGAGAAGAAATAACGGATACTAAACCATCGTTTTCTCGCCATTCTTTTTCAGTAGCTTTA
CCGATTAAGTTACCAGTAATCACAAATGGGAAAAACATATTTAAGTCTGCTTTTTGTCTA
TCGCTATTTAATGCTTTGTGCGTTGCTTCACCAGTGTATGTTTTATACACAATGTTAGGG
TTCAACGACGTTTTACGATTTAAATCTGTTGCACCCTCACGCGTCAGATCGTAAAATCCA
TTATCTTTTGATTTCCATAAATTAGATTGTTTAACGCGTTTGACATAATCAATATATGAT
TCATTTGGCTTCTGTTTTAGACCCCATTGAGCCAACCCGAAGTCTACTCTTGAATTTTTA
TTACCAAACATTTTACCGATATCAAATACGATTTGTCTCACTAAAGCTTCATTACCAGCT
AAATCTGATGCGTGTGTACCATTATGTGGTGTTCCTAAAGTAGTAATTGATGAAATCATA
TTGTCATGATTACCTTTGAATAGTGGAGAAATTTCGCCACCATGTTTCTTTTGATACTCT
ATTTCTTCACGATTACCATTACGCAGTAATTCTTCTAGTTGACGTATCGTTTGACCGCCC
ATACTATGTCCAACTAGGTGTACCTTCTGTCCTGGTTTCCAGTCTTTGTAAATTCCTTCG
TATGTTTTTCCATAACGTTCATGTCCATATTTTGCTGCATGTGCTGCACCATAATCTACA
CGACCGCCTTTGATATAATAATAAAGTTCAACTGCGCGGTCATAGTTACTTCCAAAAGCA
CTTATACTTGCTTCATAAGCTTTGTAACCATTTTCTTCTAAATCTTGGCGAATGTTCATT
TTATTACCGCCCCAATAATGAGCTAACACTGAAGGATTAATATCATCTGTAAACCCATTG
AAACCATGCACTAAAACGATAGGATCC
LOCUS 66 (E1)
CAGGATTCGTTTTATCTAACTCTTCCCCAAAAGCTGATAAGTGTTGTGTAGTTTGTGTTG
TCATTACAGTAACTAAGATTGCTGTACCTATAGAGCCTGCTAATTGACGCATCGTATTTA
AGAAAGCATTACCATGAGAGGCAAGTCGTCCCGGTAACGCATTAATAGCTGCAGTTACCA
TTGGCATCATTATAAATGCCATACCAAATGAACGAAGTACATAGATACCCATGATTGTCA
TATATGGTGTATCCATATTTAATTTAGTTAATTCCCATGTTGCATAAGTCATTACAGCAA
TACCAAAGATAGCTAATGGTTTTAAACCAATAGTATCTAACAATTTACCTGCAAATGGTC
CTAGTAGACCCATAATTAGAGAACCAGGTAATAATAACAATCCGGAATCTAATGCTGAGA
ATCCGCGTAAATTTTGTAAATAAATCGGTAATAAAATCATACCACCATATAAACTTAACA
TTACAACCATATTAATAATTGTTGTTAATGTAAATGTTGGGAATTTCAATACTTCTAAAT
TCAACATTGGTGATTTCATTCTTAATTCTCTAATAACGAATAGAATAATAAAGATAATAC
CAATCGCAAACATTGTTTCTATCTCTACTGAACCCCAACCTTTGTTGCCAGCTTCTGAGA
AACCATATAACAAAGCACCAAAACCAATCGTACTAAAAATGATACCTGGGATATCAGCTT
TAGGGTTTGTTGTATATTGATATAACTTAAACCATACAAAACCAATTAAAATAGCGATAA
TCCCGATAATGAACATACCGTAAAACATCACATTCCAATGGTAATTTTGTACAATATAAC
CTGATAATGTTGGACCAATTGCAGGTGCTAAAATCATTGCGATACCCATTGTACCCATGG
CAGCACCACGTTTTTCAGGTGGATAAATTGTAATAATAACAATTGAACCTAATGGCATTA
GTACACCTGCACCAATGGCTTGTAATACACGTCCAACCATCATGATTGGGAAATTCATTG
AAATCGCACAGATTAATGAACCAATTGTAAAGAGTACTAACGCAACTAAAAATAATTTTC
GATATGAATATTTATTAAATAGATACGCCGTAATTGGTATTAAAATACCGTTTACTAACA
TGAATCCCGTCATCAACCATTGCCCTGTTGACGCAGAAATATTAAATTCCGTATTAATTT
TTGGTAAAGCAACATTTAATAATGTTTGGTTTAAAATCGCAATAAACATACCGAATAATA
ATGCCGCTAATATTTTACCGCGTGAAACACCTTCACCAAAAATAAAGTTTTTATGTTCTT

TTTTTATTTTTTCATTCACTTTATATTCTTCTGATTCAGGATTTTTAGCAGCAACTGCTT
CCTCATCCTTATTATTAGTGAATGCTTCTTGATCTTTCTCAGACCCCTTTGTGTAACCAT
TTAGACTAACTTGGCTATGATCATCTTGATTGTCAACACGCAACTCTTCATGCGTCATAC
GTTGTGTCGATTGATCAGTTGTTTTGTCTAAATCACTAGCTTTAAATTTAGATTGATTTG
ATTGACGTGTCGTAAATTGTTGTTCCTTTTGTTGGCGTTTGCCTTTTTTTCTTGATCTTA
TTAAAAATAAATTGATAACCCCAACAATAATGAGCGCTAAAATAATGTAGCTAATAATGA
AGGTCGTAGTCATTTAATGACCCCCTTAATTTTTATGGATTTTTACTTCAGCGTTCATTC
CAGGAACAACTTGTTTAGACGGTTCTGATTCTAGAGTGATTTTAACAGGTATTACTTGAG
AAACTTTAGTGTAGTTACCATCACTATTTGATGATGGCATTAATGAAAAGCTTGCAGCAG
TTGCTTTTCCAATACTATCAACTTTACCTTTAATAGAAGCTTTTTGACCGTCAATAGTCA
CATCAACATCTTTACCTACTTCAACATCTTTAATATCTTTTTCGTCAATATTTGCTGTTA
CATATAAATCATCTAAATTGTATGCATAAGCGATTGGGTTACCAGCTTGCACCATTGAAC
CTTCCATACCATCTAATTTGGCAATTGTACCTTTTTGAGGCATT

LOCUS 67 (F119)

GATCAAAATTTTGAATTAAATACTGTCTCAATTTAAAGTCGAGTTCTTTAAGTGAAATCT
CTTCTTTATAAATGTAGTGTACTCTACCGTACGTAGCAATACCGTCACCTTCATCTCTCT
TGATTTGAAATCTTGGTGCGTTTATATAATCATAATAAGCGTCTTGATTTTTCTTAGTGA
CACCACCATATGAAAACACTGTGCCATTACGGTTTTCCGCTTCTTTAACAACAAATATGT
CTAATCCCGGATTTTTACGTGCTTTAAATCTTTCAATATCTTTACCAAATATCTGTACTC
TTGTGAATTTTCTATTTTTATCAAAGATAAGGTAATGCTTGCCACCTTTGCTATAACGAT
AACCAGTAACATTTTTAAGTTCCTTACTTGCGCCACTATAGTAATCTCTTAAGTCAAAGA
TATCTTTTGTCACATTTTCATATTTTGCTTTATGTTCACTCGCATTTACAGTTTGATGCA
ATGACGTTATTGTTCCTGTTGCTAAAATACCTAATGCTAAACTTGCTTTCGCAATTGCTG
TCATTTTCATAGTTGTATGCTCCATTCGTAATTATTAGATTTGTTCGCTTACGTCTATTG
AATCATACAGCTTTATTATAGTTAGCGTATTTGACCTTTCACATTAAACCATGTTTAATA
ATCATTGAATCATTATTAAGTAAATTAAGGAATCTATAATGTTCGTTAAATAAAACTGAT
CCCGTTGTGCTTCACACCCGATAGATAGGGATTTACAGATAAATTCAGGTCTCTTCCACG
TCATATTTGGACCCATCGAAAATTCGGGTTCTCAAATCATCGAACATAACAAAAGAAGCT
AAGCAACATGTAGGCCGTTGTCACTTAACTTCTTGTTTTTCCGATGACAGCTTCTATTTA
GAGAATGTCATGATTATTTTATATTCACTTCAATGTTATCAATATTAGTGCCATCTATGA
CATCTGCCATGCGATTTTCTTGTAATTTTTTGTGCAATTCAAACGTGTACTTTCCACCGT
TTTTCATTTTAATAACAATTTTACCTGAACCAACGTTACCGTACAGATTATTTTTTTCAA
TAAGTTGTTTTCTCAATTTAAAATCAAGTTCTTTCAAGGAAATCTGTTCTTTAGTAATCT
TGAATTCTGAAACATCATGAGAGATTGTACCTTTATTATCTTCCTTAGTAATTCTTACTC
CTGCTTTGTGATCAACTTTTTTACTATTACTCTTTGTGATACCACCGACAGAATATTTTT
CCAGATTGTAATTATTTTCTTCTAAAACGACAAATACATCGACATTCCTATGTACTCCTT
CACCATATTTTTTATCATCTTTACCAACTAAAGCAATTTTATATATGAAATAATCTGGGA
CAACATTCATAAATCTTATTGTCGTCCATTTTTTTAAAATAATACCAATCTCATTTTTAA
ATTCTAAACTTGGTTTCGTATAATACGCTCTTAAATCTTTAAATTTAGGATTTATTTCTG
TTGGTACTTGTTTTGTGGTTGGCGATTGTGGTGTGTCTGATTTAGTAGATTGCATTGGTT
GTGGCGTGTTTGTTGATGGAGGTGTTGTCACTTTAGTTGAAGGCGGTGTTGTCGCATTTG
CTGTTTGTTGCGGTGCTTCTACTTTAGTTGAGGGCGGTGTTGTCGCGTTTGGTTTTGATT
GCGGTGCTTCTATTTTAGTTGAGGGCGGTGTTGATTGTGGTGCTTCCACTTTAGTGGAAG
ATAGTGTTGTCGCGTTTGCTGCTTGCGTTGTCGTTGTGATTACACCTGTTGTTAAAAGGC
CTAGTGCTAAACTTGTTTTAGCAATCGTTGTTATTTTCATAGTTGTATGCTCCATTCGTA
ATTATTAGATTTGTTCGATTACATTCATTGAATCATACAGCTTTATTATAGATGGCGTAT
TGCTCCATTCACATTAAACCTTGTTTAACTATATTTGAATCATCGTTAAGTAAATTAAGA
AATCCATAATGTTCGTTAAATAAAAATGATTTTGATGTGATTCAACACTTGGCACATTTG
AAGTTTCGTCACTTTTAAGACATAGAAATGCCACTTTTACAAACAAATGAATATTCGTCT
TTTTACATCATTACGCATAATAAAAGAAGCTAAGCAACATGTAAACCGTTGTCACTTAAC
TTCTTGTTTTTCCGATGACAGCTTCTATTTAGAGAATGTCATGATTATTTTATATTCACT
TCAATGTTATCAATATTAGTGCCATCTATGACGTCTGCCATACGATGCTCTTGCAGTTTT

TTGTGTAATTCAAACGTATATTTCCCACCGTTTTTCATTTTAATAACGATTGTTCCTGAA
CCCATGTTACCGTAAAGATTATGTTTTTCAATAAGTTGTTTTCTCAATTTAAAATCAAGC
TCTTTCAAGGAAATCTCTTCCTTAGTAATCATGTATTCTGAAACATCGCGTGAAATCATA
CCTTGATTATCTTTTTTAGTAATGCTTAATTCTACTTTGTGATTAACTTTTTTACTATTA
GTCTTCGTGATGCCACCGACAGAATATTTTTTCAATTGATATTTATTGTCTTCTAAAACG
ATAAATACATCGATATTATCGTAAGGTCCATCTTTATATTTTTTCTCATCTTTTCCAACT
AAAGCTATTTTATAGATGAACCTATTTGGAATAACATTCATAAACCTAACCGTCGTCCAT
GGTTTGAGCATAAATCCAAACTGCTTTTCAAATTCAAAACTCGGTTTTGTATAATACGCT
CTTAAATCTTCATATTTAGGAGTCATATCTGTTTGTGCTTGTTTTATGGTTGGAGATTGT
GGTGTGTCTGATTTAGTAGATTGCATTGGTTGTGGCGTGTTTGTTGATGGAGGTGTTGTC
ACTTTAGTTTTCGGCGTTGTGGATTCGGTTGTCGTTTGTGATTGTTCTTGTTTAGGCGCT
GGCGTTGCTGATATATTAAGCGTTTTCTGCTCTTCTTGTTTAGGTTGTGATATTTTTTCT
ATTTTGGAAGCTGAGGTTTTTTCCTCATTAGTATTTGGTGCCTTTTCGAGTTTAGGCGTG
CGTTCTTGTCTTGTGTTAGCTGCTTGTGTTGTCGCTGAATTTGCACCTGCTGTTATGTTT
ATCATTGCTAATCGCTCTGCTTTAAGCGTTGGTACTTTGTCAACTTTAGTTGATTGTATT
TTTTCTGCTTTGACCGATTGCGTCGTTACTGTAATTGCGCCTGTTGTTAAAAGCCCTAGT
GCTAAACTGGTTTTAGCAATTGTTCTCATTTTCATAATTGTATGCTCCAATCTATATTAT
ATTCGATTGTCTTTTTACGTAATTTGAATCATACAACATCATTATAGATGGCGTTCTAAG
ATAATCACATTAAACCCCTTTTAACAATTATTGAAGTATTATTAAGTAATTTAAGCAAAA
AATAATGAGTGAGTATGAGATTAATATAGCGTTTCTATGTGCCTTTGAAATAATTTTTAA
GCATTAAAAAGAAGTTAAGCAACGTTTGATCGTCACTTAACCTCTCTATTTCAATTTCAA
CTTATTTCGTCATCAAGTATATGTGTTATGCTTTTATAACTTTGATTTCAATTCTATCAA
TATCTGTGACATTGATAACATCGGACATACGGTCTTCTTGTAACTTTTTATCCAATTCAA
ATGTATACTTTCCATAGTATTTCTTTTTGACTGTAATTTTTCCTGTACTCATTTCACCGT
AAAGACCATAATTATCAATAAGGTATTTTCTTAATTTAAAATCAATCTCTTTCAATGACA
TCGCTTCTTTATCTATTTTAAATGGGAAAAAGTCATAATCAT
LOCUS 68 (G27)
GATCTGCTAATTCGTTTGTATTTTTCACAACAATTTCATGCGCTTTTTCTTCACCTAAAA
AATGAAACTCGTTTAACATTTCATCTGTAGTTCTAAAATGTGCTTCCGGTAAAGTTGAGC
GATTAAGTGGATTGCCGGGTTGTGATGCTATTAAAATTTTACGTGCGATACCATCATGTT
CAAACAAATAGTGTGCATTTCCTGTCGCAATAACAGGTATACCCGCTGTGTCACCTGCAT
GTATTAAACGTTGATAAATTTCATGTAATGTTTCAGTATCTCTAATAAGCTCTCTATCAA
TTAAATCTTGATAAAGTGCCGGTGGTTGAATTTCAATAAAATCATAATATTTGGCAATTT
TTTCAACTTGACTCTGGTCCTTCTGCATAACTGCCGTAAATAATTCACCTTCATCACACG
CTGTACCTACCAATAATCCCTCACGATATTCATCTAACAATGAACGTGGAATTCGAGGTG
TACGGTAGAAATACTTCACCAATGATGCACTTACAATTTTAAATAGATTTTTAAGACCTT
GTTGGTTTTGTACAATTAATGTGACATGACTAGGTCTTGCACGTTTATATGCATCTTCAT
TACTGAGTTTTTTGTTGATTTCGTTATGATTTAATACGCCTAATTCTTTCATTTGTTGAA
CCATTTTTATGAAAATGTAAGCTGTTGCTTCTGTATCATAAATGGCACGGTGATGTTGCG
TTAATTCTACGCCATATTTTTTTAGCCAAGAAATTCAAACCATGTTTACCATATTCAGTAT
TAATCGTACGAGATAATTCTAAAGTATCGATAACACCATTCGTTGATGGTCCAAACCCAA
GACGTTCATATCCCGTATCGATGAAGCCCATATCAAACGAAGCATTATGCGCTACGAATA
TCGCATCGCCAACCCATTCTTTAAACTCTGTAAGTACTTCTTCAATCTCAGGGGCATCTA
CTAACATATCATCAGTAATATGCGTCAAATTGATAATCGTTTCCGATAATCGTTCATGCG
GATTACTAAACCTTTCAAACTTATCGATGATTTCACCGTTATGAACTTTCACAGCTGCAA
GCTCGATGATTTTATCATACTGATTTGATAAACCAGTTGTCTCAACGTCGAACACAACAT
AAGTAGCATCTTTTAATACGACATCTTGTGGTTTGTATGCAATCGGAACACCATCATCAA
CTAACATACCTTCCATACCGTATATCATTTTAATGCCATGTTTTTCCGCTGCTGCGTGAG
CATCTGGAAATGCTTGCACAACATTATGGTCTGTAACCGCAATGGCTGGATGTCCCCAGT
CTGCTGCCTGTTTAACATACGCACCAATATTGGGTATACCATCCATTTGGCTCATTGCAG
TATGCAAGTGGAATTCTACACGCTTTTCTTCAGCCTTATCTTTTTTTGTCGCTTTTTTAA
TCTCTTCAATATCAGACATCATCATAACTAAATCTCTAATAAATGTATCTTCTTCAATAC

GACCTTGAGCCCTAACCCATTTACCAACACTTAGCGCTTTAAAATGTTCTAAATCATCTT
TGTTTTTACGAGTAAACATTTTTAAAACTAAAGAGTCCGTATAGTCAGTCACTTTAATTT
CTACGATATGGCGACCACTTTTAAGTTCTTTTAAGTTTATATCAAAAATGACACCCTCTA
TTGCAACTTTAAACTCTTCCTCAATAATAGATTCAATTGGTTTAATATTTTCAATTTGAA
TCGGCTTACCAATTTGACACTTATCGACAGCACTTTCGTTGTTATCTTGTTGTTTCGCTT
TTTCAGCTTTCATTTTTTCAAGTTTCTCTGTTGCCAATCGTGCACTTTGTTCGTCTTCTT
CTTGAATATGTGCTTCTAAAGAAGCTAAGTTTTGTTCTTGATCATTATCATTTGTTTCGA
ATATGATTTTATCGATATCAAAACCACAATTTCTAAACGCTTTGATAAGACTTCCATTAC
ATGCCTTATCAAAATGATTACGTTCAATGTCATTTGATACCATTACTTTTAATACTTTTC
CAGACATAATAAGCTTTTTTCTGTTTCAATTGACCTTTAACTTTTGGAGATAAAGCTGTTT
GGTCAATACAGTGCCCAAAGTATTTAATTGCATGTTCATCTTGATTCGTGCCATTTGTTA
CCGTAAAACGACATGTAACGTTGGCGATATCTTTAAACTCTTGCTCTATTGCATTTATAA
ATAATAAATAATCTTCATGAGCTAAGAATTGTGGTAATGTAATATGAAATTCCCATGTTC
TGTTTTTGTTAGAAACATCTATACGTGTCAGTTCACCTGAATTTAA

LOCUS 69 (H110)

GATCCAGCGAGTGGTTACGCTAGCATTTTAGGTATCCCAACATTACAAACAGGTGTGTTC
GGCGGTATTATAATCGGGGCCCTGGCAGCTTGGTGTTATAACAAGTTCTATAACATTAAC
TTACCATCTTATTTAGGTTTCTTCGCTGGTAAGCGTTTCGTACCTATTATGATGGCTACA
ACATCATTTATTTTAGCATTCCCAATGGCATTAATTTGGCCAACGATTCAATCAGGATTA
AATGCATTCAGTACAGGATTATTAGATTCAAATACTGGTGTTGCCGTATTCTTATTTGGT
TTCATCAAGCGTTTATTAATTCCATTCGGTCTACATCACATTTTCCACGCACCGTTCTGG
TTCGAGTTTGGTTCATGGAAAAATGCAGCTGGTGAAATTATTCACGGTGACCAACGTATC
TTTATCGAACAAATTCGTGAAGGCGCACATTTGACAGCTGGTAAATTCATGCAAGGTGAA
TTCCCTGTTATGATGTTCGGTTTACCTGCAGCAGCTTTAGCAATTTATCACACAGCTAAA
CCTGAAAATAAGAAAGTAGTAGCAGGTTTAATGGGTTCTGCTGCTTTAACATCATTCTTA
ACTGGTATTACAGAACCATTAGAATTCTCATTCTTATTTGTAGCACCATTATTATTCTTT
ATTCACGCAGTACTTGATGGTTTATCATTCTTAACATTGTACTTATTAGATCTTCATCTA
GGTTATACATTCTCAGGTGGTTTCATCGACTACTTCTTACTCGGTATACTACCTAATAAG
ACACAATGGTGGTTAGTCATTCCTGTAGGTCTTGTATACGCAGTTATTTACTACTTCGTA
TTCCGATTCTTAATTGTAAAATTAAAATACAAAACACCAGGTCGTGAAGATAAACAATCA
CAAGCGGCTACTGCTTCAGCAACTGAATTACCATATGCAGTATTAGAAGCTATGGGTGGC
AAAGCAAACATTAAACATTTAGACGCTTGTATCACACGTCTACGTGTTGAAGTTAACGAC
AAATCTAAAGTTGATGTTCCTGGTTTGAAAGATTTAGGCGCATCTGGTGTATTAGAAGTC
GGCAATAATATGCAAGCAATTTTTGGTCCTAAATCTGACCAAATCAAACATGAAATGCAA
CAGATTATGAATGGTCAAGTAGTAGAAAATCCTACTACTATGGAAGACGATAAAGACGAA
ACTGTTGTTGTTGCAGAAGATAAATCTGCAACAAGCGAATTGAGCCATATCGTGCATGCA
CCATTAACTGGTGAAGTAACACCATTATCAGAAGTGCCTGATCAAGTGTTCAGCGAAAAA
ATGATGGGTGACGGTATCGCTATCAAACCTTCACAAGGTGAAGTTCGTGCACCATTCAAC
GGTAAAGTACAAATGATTTTCCCAACAAAACATGCAATTGGTCTTGTATCAGATAGTGGT
TTAGAACTATTAATCCACATCGGTTTAGACACTGTTAAATTAAACGGAGAAGGCTTTACT
TTACATGTTGAGGAAGGTCAAGAAGTTAAACAAGGTGATTTATTAATCAACTTTGATTTA
GACTACATCCGCAATCATGCAAAGAGTGATATTACGCCTATTATCGTGACACAAGGAAAC
ATTACAAACCTTGATTTTAAACAAGGTGAACATGGCAACATTTCATTTGGCGATCAATTA
TTTGAAGCTAAATAATGCTTACTATAAACAGGTGCGTATACCTTCATAAGGTGACGCGCC
TGTTTTTTCTTTGCTATTGTATTTTGCAGCATCATTGATAGTTCGCTCTCCCC

LOCUS 70 E100

CCTTGAGTATGTTTACCTAAACGTTCTTGAGTAAGCTCATCAGCTTTATTCATCGCTTCA
TTAGTAGCTGCTAACACTAAGTCTTGTAGCATTTCAATATCGTCTGGGTCTACAGCTTCT
TCTTTGATTTCAACGTCGACAACTTCTTTATGACCAGTTACAGTAACTGCAACCATGCCA

CCGCCAGCTGTTCCTACAATACGCTCTTCTTTAAGTTTTTCTTGTTCTTGAGCCATTTTC
TTTTGCATTTTTTGCATTTGTTTCATCATTTGTTGCATGTTTCCGCCACCGCGCATATTC
CATTTCCTCCTTGAAAATCAATAAATATTTATCAATAAAATGATGTTTCTTTCATTATAC
ATACGATTATATCGCTTGTCATGTATCACTCTTCATCTATCACATGTACAGTTTCTTCAC
CGAAAAGATCTTTTGCTTTTTGAGCAATATCTGTTTGTTGTGCTTGTTGCTTTGGCATAT
CATCGCCTTCGTTTTTACGATTTTGTAAATATTCCGTTCGAACTCTTTGCCATTGATCTG
ATGGTACACCAACAACTTTAACGTTTTTATTAACGATATTACATACAACACTTTCTATAC
TACTACGTTTCTCGTCGTCTTTATTGACGATTTCACAATGGATCTCTTCCTCAAATTTCA
CAAGTACGTGATCTTCACTTGCCGCCACAGGTTCCGAATTTTGCAATAAACTAACGAGTG
ATTTTTTATCATTATTTTTGGCATGATCAATCACTTCTTGCCAATGATCTTTCAACAATT
TGATATCTGCCTTATTCGCTTTATCTAGCACTTTTGCAATTTGTTGCATTGAAAATGCAT
TTTTAGATTTTTGTATGCCTCTCGCAGGCTTTTTCGAAGATTTTTGAACAGGAGCGACAC
TCACTCCTTGTGCTTTTAGTGTTTTTAGTTCTTGCTCTAACTGTTCCATACGTTGCAACA
ATACATCTGTGTTTGGCGATGAAGCAATTTGTGCTGGTTCAGCTACATTCGCAATCACTT
GTGGTTGACCCTTAATCTGCTCAGCTAATTTTACTAACAACACTTCAAAATGAACGTTTT
GATTCACACTAAAACGAATCGACACTAATGTATCATTAATAAGATCAATCATTTGATATA
ACATATCTAATTCTAAGTTCATCAGTGCTCGATACTCAGTATCTTTCTCAGATGTTTTAT
TCATAATCGTATCTCTGACAAAATAAATCATATCATTTATTAGGCGATTCACTTCTTTAC
CTTCTGTTATAAACTGATGGTATTTTTTAAAAGATGCTTGTACGTCACCTTGTACAATAT
CATCAAACAAGTGATCCAACGCTTCATCATGTACGCTACCTGTGACATTCAACGCATCTT
GCAATGTTAACGTACCATCACCAAATGCAATAGCCTGATCCATAATACTTAATGCATCAC
GCATACCCCCTTCAGACGCTTTAGCGATAAATGCCAAGGCTTCATCTTCACATTCAATTT
GTTGTGCATCTGCTACAAATTTTAAACGTTCAACAATTTGATCTAGGCTAATTGCTTTAA
AATCAAAACGTTGTGCCCTAGAAATGATTGTTGGAGGGATTTTATGTGGTTCTGTCGTTG
CCAATATAAAAATAGCGTGTGCTGGAGGTTCTTCTAACGTCTTTAAAAGGGCATTAAAAG
CACCTGTTGTTAGCATGTGCACCTCATCTATAATATAAACTTTATATTTCGATTCACTTG
GTGCATATTTAACTTTGTCTCTAATATTTCTTATTTCATCAACGCCATTATTACTAGCAG
CATCAATTTCTATCACATCTGAATTAGTCCCCTGCGTAATGCCTTTACAAATATGACATT
CATTACAAGGTTCTCCATCAGTGCTATTTAGACAGTTGATTGCTTTAGCAAACACTTTGG
CAATACTCGTTTTCCCCGTACCTCTCGGACCACTAAAAATATAAGCATGCGACTGTTTTT
CTTTCGAAATCGCATTGCGCAATGTCTTCGTGACATGTTCTTGTCCGACGACATCCTCGA
AACTTTGGGGTCTGTACATACGATATAAGGCTTGATAATTCAAGTTAGCACCTCCATAAA
CAATTACCTCTCATTATAGCATGATAATACCTTTACTTCTTAATTGAACAATTAATAAAA
ATGTTCTGGAAATTTTACGATTCCGTGTGGTGCATCCGTCAAATTATCCCATAAATATTT
TACAAGTAACGGTGCATCACCAGATTCTAATTTAATGTCATGCTCAGCAGCATTTTGATA
ACCCAACTTTTCAAAGTAGTCAAAACAATGGTCTACAACAACCGTACTATACTCTTGTGC
TTTGGCACGCTCTTCTACTGCTTGAACCAAGCCACGACCTAATTTTTGTCCACGTAATTC
AGGATGAACTGATAAAGAGGCAATCGCCAAACCATAATACGTCTTATCATCACTATTAAT
TTCTACTTCAATTAATAAAACGTGTCCAACGACATCGTTATTTTCATTTTTCGCTATTAC
TTCTAATTCAAAATTATAGCAAGGAGATTTTCTTAAATGTTTTACTTTCGCACGTGCTTG
CCAACTCGTTTCAGGATTATCATCAAAACTTTCTTCAATACTATTTAAAGATTTATCATA
ATCTAACTCTGTTAAAGTACTTAAATATATTTGCATATGTCCTCCGTAGGCATTTGATTG
TCAATAATCATAACGTATCTCATTAATAATTCTATTGTAAGATACTCCCCCTCATTTCAC
CATCATTTCTTTATCATCAAATTATAACTTCTTACTTTTCATTGACACAAAAATCATTCA
AACTGCACATCGAGTTCACTTGAATCAAACTTCACATATAAAAAAGCTACTTCCCACAAA
CATGTTCCACGTATAATACGCTGAATTGTCTTCAAGAAAGTAGCTTCTATAATTATATAT
TTTCAACTCTTAATAATCGGTTTAATATTTAAAAAATAAAAAACCGTGCACCTAAGCATC
GAACGTAATTCACGAACGTAACCAAAGTCGTTAGCTAAATCTCGGCTACCCTACGGCACA
TATGATGATCCACTTAATGCTGCTTCCGTCAGGACCTGACATGGTTCATGGGTTCATATT
GCATAGGACCGAAATCTTCAAACACTACGTGCTTTGGGCAGACTTCGCAAAAATACGGCC
TCAACAAAGGAATTAAGCCTCGCATAAAGCGGATTTCGAGTACAGGGAACCGCTACCTCC
CCACCTAGCACGGCAAGATATATATTACTATATTTTAATAGTTAATTGCAAGTATAAATC
ATTTATATCATTGTTTACTTTATACGACGTCTTGAGAAGTCATTAAATTTAAATTCATTT
GCAAGATGTTTTGAAATATTATATTGAAACGGCATTGTATTTTCTAAATACACAATACTT

CGAACTGTTGCTGAATAAGCCACCGATACATCACCAAACAATTGATATGCTTGTTCATCA
AACGGTTCAAAAGTAATAGACTTACTTGAATAACTAATATTAAGATTTAATACCTTTTCC
AAATAATCATAAATAGAATCACTCGCAACATCATTACCTAT
LOCUS 71
CTTCTAACATATTAACCCACTCGTTTGTAGCAGCGTTAAAACCAACACCCGGCTCTGCGT
TTTTCAAACGTTCTACAATAACAGAACCTTCTAATCCTGCATTTTCAGCAATTTGACGAA
CTGGTGCAGTTAATGCTTTAAGTACAATATTTACACCTGTTTCAATGTCACCTTCAGCTT
CAATTTCACTTACTTTTTGGTAAACATTTACTAATGCAGTACCACCACCTGCAACAATAC
CTTCTTCAACTGCTGCACGTGTAGAATTTAATGCATCTTCAATACGTAATTTACGTTCTT
TAAGCTCTGTTTCACTTGCTGCACCTACTTTGATAACTGCAACACCACCTGCTAATTTAG
CTAAGCGCTCTTGTAATTTTTCACGATC
LOCUS 72
CTAATAAATGCACCCTTTTGTAACCAATCATATTCAATGTATGGTTGATCCGTTACGGTA
CATGTAATGACTACTTCACCATTTGATACTGCTTCTTTAGCATTTTCTGTCGCAATAAAA
TTAATTTCCGGACGCTGTTGTTGCCATCTATCAACAAAGCGTGCACATGCTTCAGAGAAT
TGATCGTAAACAAACACGCGTTCAATATGATCGAATTGCTCTAACATACTTTGTAATTGC
TTGTCTCCGATTAGCCCGCATCCAATGATTGTTAAGTCTTTAAATCCTTTTTTAGCCAAA
TGCTTTGCTGCAATCACTGAAACTGCTGCAGTACGCATACTACTAATTAAACTTGCTTCC
ATAACTGCAATTGGATAATTCGTTTCTGGATCATTCAAAATAATGACGCCACTTGCACGC
TCCATATTACGTTTCGATGGATTGTCGTGCTTACTACCTATCCACTTAATACCTGAAATT
GCGTGTTCACCACCGATATGACTTGGCATTGCAATAATTCGATCTGCGATGTGTCCATTT
TCAGGATCCTGTCTTAAATACGGCTTAAGCGGTTGTACAAAATCATTGTGCGCATGGGCT
GTTAATGCTTCTGTTAATGCGTCCACATAAACTTGTGAATGATTACCTCCCGCTTGTTCA
ATATCTGATCTATTTAAATACAACATCTCTCTATTCATTCTGATTTAACTCCTTGTCTTG
ATTTCATTTTTTCTAACCATGTATCTGAATAAACTAAATCTAAGTAACGATCGCCTCGAT
CTGGTAAAATCGTGACAATTGTTGCACCTTCTTCAATTGACGTTATCAACTGCTCAATCG
CTGCAATAATCGAACCTGTTGAACCTCCGGCAAATATGCCTTCATAATCAATCAGTTTTC
GACAGCCCAAAGCAGATTGATAATCATCTACATGGATCACTTGATTAATTTCTGATCTAT
TCAATATTTCGGGTACACGACTAGCACCGATACCAGGTAATTCTCTATTAATAGGTTTGT
CACCAAAAATGACTGACCCTTTCGCATCAACAGCAACAATTTGTGCGTTTGGATGCACTT
CTTTTATTTTTCTACTCATACCCATAATGCTACCTGTCGTGCTGACTGGCGCGACAAAAT
AATCTATAGGTTGCTTAATTGTTTCAACAATCTCTGTGCCTGCACCATGATAATGGGATT
GCCAATTTAACTCATTCGCATATTGATTAATCCAATATGCATCGTCAATAGTGGCTAACA
GTTCTTGCACCTTTGCAATACGAGTCATTAAATAACCCCCATGTGCATCAGGTTCTTCAA
CCATTTCTACATTGGCACCATAACTTTTAATAATTTTCAAATTTGTTGGTGATATTTTAG
GATC
LOCUS 73
ATCTTGTAATTCTTGTGCCCCAACGTTTGATGTCATTATGATAATTGTATTTCTGAAATC
AACTGTACGTCCTTTTGTATCTGTCAAATGTCCATCATCTAAAACTTGTAATAGAATATT
AAATACATCTGGATGAGCTTTTTCAATTTCATCAAATAAAATTACAGAATATGGTTTACG
TCTAACTTTTTCAGTTAATTGTCCACCATCATCATGACCAACATATCCTGGAGGAGCACC
AACTAATCGGCTCACTGCGTGTTTTTCCATAAATTCACTCATGTCTACACGGATCATCGC
ATCATCATCGCCAAACATTGATTCAGCTAAAGCTCTAGCTAATTCAGTTTTACCAACACC
AGTTGGTCCAAGGAAGATAAAGCTACCAATTGGTCGTTTAGGATCTTTTAACCCTGCACG
GGCACGTCTAACCGCTTTACTGATTGAATTAACAGCATCTTTTTGCCCAATAACTCTCTC

ATGTAATGTATCTTCTAGACTAAGAAGTTTTTCAGATTCTGTTTCATTGATTTTAGTTAA
TGGGATACCTGTCCATCCTGCAATAACTTCAGCAATATCTTCTTCTGACAATGAAGTTGA
CATGCCATTTTGTGCATTCTTCCATTCATTTTTAGCTTCTTCATATTGCTTTTCAAGTTT
TGTTTGTTTATCACGCAGGTTAGCAGCATTTTCAAACTCTTGAGCATGTACTGCGGCATC
TTTTTCATTTTTAACTTTTTCAATTTCTTGTTCAATTTCTTTTAAATTATTAGGTGTCGT
ATGACTCTTAAGTCTTACTTTAGAACTTGCTTCATCAATTAAATCAATTGCTTTATCTGG
TAAGAAACGATCTGAAACGTATCTGTTACTTAATTTAACAGCTGCTTCAATAGCTTCGTC
TGAAATATTAATACGATGGTGTGCTTCGTAACGATCTCTTAATCCTTTTAAAATAGCAAC
TGTATCTACTACTGAAGGTTCATCAACTTGTACAGGTTGGAAACGACGTTCTAAAGCCGC
GTCTTTTTCAATATTTTTGCGATATTCATCTAATGTAGTAGCACCAATACATTGTAATTC
ACCACGTGCTAATGCCGGCTTCAAAATATTCGAAGCATCGATAGCACCTTCAGCACCACC
AGCACCAACTAAAGTATGCAACTCATCAATAAATAGGATGACATTACCTGCTTGTTGGAT
TTCTTCCATAACCTTTTTCAGACGCTCTTCAAATTCACCACGATATTTAGTACCTGCAAC
TACTGTTCCCATATCTAAAGACATAACACGCTTATCTTTTAATGTCTCTGGTACCTCATT
ATTCACTATGGCTTGCGCTAAACCTTCAGCAATAGCAGTTTTACCAACACCTGGCTCTCC
AATAAGCACAGGATTGTTTTTCGTACGTCTACTTAATACTTCAATTACACGTGTAATTTC
TTTATCACGTCCTATAACAGGATC
LOCUS 74
TATATAAATGATCATTTCAAATGATATAAATATTGTGAGAGTGATACAGAATTGATAGAC
AATGCTCACCTGTATATGATGACATGAAGCATTTTAAAACTACCGCAATCTCAACATAAA
AATACCGAGACTTCCAAATAGAAACCTCGGTACATTTACTTCAATTATATTTATACATCA
TCATAGCTGACTTCTTTTTCAGCTACAGTTTTACCGTCAACTTTAACAATATAACTTGCT
GTTTTTCCTTTTTCAATTCTTAAAGGAATGTCTATACGTTGATCACTAGTAATATCGAAA
CTACCTTTTTCAGTTGAACCGTCATTATCTTTATCTTTAATATAAACTTTAACTTTTTGT
GACTTATCATTTTTACCAGTGTATGGTACATCTACCGATTCAGTTGTCGTTTTGACATCT
GATGAGTCACTTTTTTTACCTTTAGAAACAACAAATGAAATCGTTGACCCCTCATCTACT
GATTTTCCTTTAGGAGATTGAGAAATCACATCACCCTCATCAATATCGTCACTATACTCT
TCCTTACTTTCAACTTTAAACCCTTTTTCTTCTAAGGCTTTTTTAGCTTTGCTAAAGGAT
TTATGTTCAAAGTCTTCTACATAAACTTGCTTAATGCCTAAAGATTCATATAGTTTAATA
TTAGAATCATGAATAGCGATTTCAGTATTTGCGGTTACACTTTGATTTGCAATGTATCCT
TTTGGCGCTTGATTATTATATACTTTTTCAATCGTAACATCTTTAAGACCTAACGATTTT
AATTTCTGCAAGGCTTCCTCCTTAGGTAAACCAATGACATTTGGCATTTTAACCTTTTCA
GGGCCCTTTGATATAACAACATCAACACTGTCACCACGTTCAACACGTTCACCAGTATTA
GGAGTTGTCTTAATAATTTCATTTTCAGGATATTTATCACTATAACTTCTAGAAATTTTA
CCCAATTTCAGGTTGTTTTTATTGAATATTTGCTCTGCTTCTTTTACAGATTTCCCGATT
ACATCAGGTGTCTCTTCGTATTTATTACCAAACATTGCCATTGCCACAAAAGAAACAAGT
GCAATCATTAACAACGAAAAGATTAGTGATAAGAGCACAATCTTTCGTGTTGATTTCTTT
TTAGGTTTTGGTTCGTACACCGTACCTTCTGGCTTTTGGAATTGCTGATGATGAGCAGGC
CCATTTACAATAGGTACTTGCGTCGTTTCACGTTTAGGTTGATTCGACTTATGTTCACTA
ATATGCTTTGCTAGATCTTCTTTTTTCAAAGGTACCGCTATCGTTTTCATTTTATCGAGT
TCATAGACATCTTCATTCGCTCGATTTTCATGTAAAACACTACTCAAATCATCTTTCATT
TCTTGAATTGTTTTGTAACGATTCGCTTTGTCTTTTTCTGTAGCGCGTAAAATGACATTA
CTTAAAGATTGCGGAATATCCTTACGTACATCTGTTGTCACATTTGGCACAGAATCCTGA
ATATGTTTAATCGCAATGCTAACTGCAGTTTCTCCATTAAAGGGTGGTTCACCAACAAGC
ATTTCATATAACACAATACCTATAGAATAAATATCTGTACATTCATCCGTTGCCTCACCT
TTTGCTTGTTCTGGCGAAAAGTACTGCACAGTACCTAACACATGATTAGTCTGAGTTAAA
GACGTCTCACTTAAAGCTTTAGCAATTCCAAAATCAAATATTTTCAACGTTTTATTGCTG
TCAATTAATATATTTTGTGGCTTAATATCTCTATGTACAATACGCATATCATGCGCATGT
TTAATGCCATCCAATATTTGATTCGTAAAATTAATCGCTGTGTCAACACTTAATGGCCCA
TGACTTTCAATATACTCAGACAAAGTCGGACCTTCGATATATTCCATTACTAAGTAGTAA
CAGTCATCTTCTTCATCAACATCGATCATACTTACTATATTTTGATGTGATAGCTGTGAT
GAGTTATGTACTTCTCGTTCAAAACGTTTTAATGTTTCTTCTTTTTCTCTAGGTGGTATA

AAAATCGCCTTAATTGCAACTTTAATGTTAAGTATCGTATCTTCAGCAAGATAAACGGTA
CTCATGCCACCGCCGCCAAGCTTATCTACAATTTTATATCGTTCATTTATTATTTTACCT
ATCATACTTTATCACCTTCAATAGCCGCGAGTATGAAAGTAACGTTATCTTTCGAATGGT
TATCTAATGCCAATTGCATTAATTGATC
LOCUS 75
TAGGTCCTCATCAGCAATCGCTTTTTCAATTTCTGGTAATAAAGGACCTGAATTACCGAT
ACAAGTTGTACATCCATAACCAACCAAGTTGAAGCCTAAATCATCTAAATAAGGTTGTAA
GCCAGCATCTCTTAAATATCCGGTAACAACTTTTGATCCTGGTGCTAGAGAAGTTTTAAC
GTATTCAGGAACTTTCAAGCCTTTTTCAACTGCTTTTTTAGCAACTAAACCTGCACCTAA
CATTACATAAGGGTTAGATGTATTTGTACATGATGTAATTGCTGCTATTGCAATATCACC
TGTTTTCATTGTAGCTTTTGATCCATCTTTAAAGTTAATTTCAGCTTTCTTATCAAATTC
ACTTTTATCTAAACCGTGTCCTTGGTTGCCTGCTGGAGCTGTTACAGAATTTTCAAATGA
TGATTTCATATCACTTAAGAAAATTAAATCTTGAGGACGTTTTGGTCCTGAAAGCGATGC
TTCAACTGTTGATAAATCCAATTCGATAACATCTGTATAATTAGGATCTTCTTTCTCAAC
ATCAAAGAACATATGGTTTTGTTTCAAATATTCTTTTACTAGCGCGATATGTTCGTCTGA
TCTACCAGTTAACTTCATATATTTAAGAGATTCATCATCAACTGGGAAGAATCCGCAAGT
TGCTCCATACTCTGGTGCCATGTTTGCAATTGTAGCACGGTCTGCTAGTGGTAAATGTTG
TACACCTGGACCAAAGAACTCCACAAATTTACCAACAACACCTTTTTTACGTAGCTCTTG
AGTTACTCTTAACGCTAAATCAGTTGCTGTTGCGCCTTGTGGTAATGAATTTACTAGTCG
TACACCAATAACCTCTGGAATTGGGAAATAAGAAGGTTGTCCAAGCATTCCAGCTTCAGC
TTCAATACCACCAACACCCCATCCTAGTACGCCAATACCATTTATCATTGTTGTATGTGA
ATCAGTACCAACTAATGTATCTGGAAATGCAGTTTTTTCACCATCTACATCACGAACATG
TACAACACTTGCTAAATATTCTAAGTTAACTTGGTGAACTATTCCAGTTGCAGGAGGAAC
TGCATTGTAATTATCAAATGCTTTCGTTGCCCAATTTAAAAACTGATAACGTTCATAGTT
ACGTTCAAATTCTAATTTCATATTACGTTCAAGAGCTTCTGGATTTGCATAGCTATCCAC
TTGAACTGAGTGGTCAATAACTAAATCCACCGGTACTTCTGGATTAATTTTAGTAATATC
TCCCCCAACGTCATCCATTGCTTTACGTAAAGAAGCTAAATCAACTACGGCTGGTACACC
TGTGAAATCTTGTAAAATAACACGAGAAGGTTTAAATGGTACCTCGCCTTCATTTCCATC
TTTTCCAAACTGACTTAAAGCTTTAATATGATCGTCTGTAATTACAAAATCATCTTCTTG
ACGAAGTAAAGATTCTAACAAAACACGAATTGAATAAGGTAAATTGGAAACTTTAGTAAT
ACCTTGCTCTTCTACAGCTTTTAAATCATAGTAAGTATAACTTTGGCCATTCAAGTCAAA
ATGTTTTTTTGATTGCTCTTTAAAATTTGCAGCCATTTAATGATCC
LOCUS 76
TGCGTTCTCTTCAACACATGGCGCATCATCTTCTAAATGACTACCCATAAATTGTTTAAC
AAATTCACTTTGAGGATTATTTTTAAATCCTTCTGGTGTGTCAATTTGTTCAATATGCCC
TTCATTCAAAAGACAAATCTTATCACCAAGTTTCATCGCCTCTTGAATATCATGTGTAAC
AAATATGATTGTCTTCTTAATTTTAGTTTGTAATTCAATTAAATCATCTTGAAGTTTTTC
TCGGCTGATTGGGTCTAATGCACTAAACGGTTCATCCATTAAAATAACTGGTGGATCAGC
TGCTAACGCACGTATAACTCCTACACGTTGTCGTTGCCCCCCTGACAATTCATCAGGTTT
TCTGTTTTTATATTTTTCAGGTTCTAATCCAACCATTTCAAGTAATTCATCTACTCTTTT
ATCTATATCTTTTTCTTTCCACTTTTTCATTTGTGGCACTTGTGCAATATTTTCTTTGAT
TGTCATATGTGGGAATAATGCAATCTGCTGCAATACGTATCCAATATCCCAACGCATTTC
GTATACTGGATAATCACTTATTGGTTTATCTTTAAAATAAATATAACCTTCACTTAAGTG
AATGAGTCGATTAATCATTTTTAATGTCGTAGTTTTTCCACAACCTGAAGGTCCAATTAG
CACAAAAAATTCACCCTCATTAATATTGAAACTAATGTTATCGACAGCAACATGTTTGCC
ATAACGCTTAGTTACATTTTTAAACTTAATCACTTTGCCACCTCTTTTTTTCTCATAGCA
TAAAACCGAGATTATATGTATGTATTCCCTATTTAACCACGTTTATTACAATTTTCAAAT
TTAAATGATTTATCCTTGAACTTTTTTAATAAAATAATGAATAATAGGTAATCTCCAGTT

AAGAAATAGTGTTATTTTACCTTGAATTCAAAAAAACACCCAGTAAAACAAGGAATGCTT
ACTAGGTGTCTTCACTATACTTTGGCTTTATAATTTTGAATCGTTTCTAAAAATGCTGGA
CAATAATGTTTTAATTTGTAACTACCTACGCCATCAATATTAATCATATCTTGTTTCGAA
GCAGGCTTACGTTTAGCAAATTCCTCCAACGTGTAATCAGAAAATATACTTACAGGTGCT
ATCGTTAATTTGTCACTTAACTTTTTACGAACTTCTACCAACTGACTGAATAATACTCGG
TCAACCCCTTCAACCGTATTTATAAATACTTTTTCAGTCGCTTTTTGCTTAAATGGTGTT
GTGAATACTTCTACTTCATTACTGAGTAATTTTTTAATTGAAGTATCACACATTAATATT
TCGTCATTTTCATTTAAGAACCCTTTGAATCTTAATTCATCTATTAAGTGACTTAATTCT
GATGTTGTGTAACCTTTCATTAAACCATG
LOCUS 77
TGGACCTGTTAATCCAGAAGTCGGCAATATGTTTAACTTCACTGAAACGTAAATAATAAG
TATTGAAGCTATCCAATATGATGGTAATGCAGTTAGAAAGAAAGCCACTGAACGTATCGC
ACGATC
LOCUS 78
GATCTTCAGCTTGATGTTTTCGTTTGATTAAATTGGTAAAATAGAA
ACGCAATCCACAAAAATGGCAAGCACTAAAATAATGTTTGGGGGTGCTTGTGCTTTTGTG
GATTGCGGTCGATTATTTATATTGCATGATTTGATTAATTTGATTGATTATATTGGACAT
GATGGTGTTGGCGGGATGCGTTGTTGCTAGTCGCGGGCTTTGTCCACTCCACATATGTAT
TAACTCTTTGTCGCCGATGTTTGCTGCGGCTTTTCTTATGCTACTTGTTAGCTCATTTTG
TATTGGATAATCTGGGATATCGCCTTCGTATTGGGACATTTCTTCGATAAACCTATTGTT
GATACCGCGTGCAAGCTTTCCACTAAACGCTTTTGTAATGACTGTATCTGTTTCTTTACT
ATTTATAATTGCATCTCGCAGTAGTTCTGATGCATTACTGTCTTGTGATGTTAAAAATGC
GGTGCCCATTTGTACCCCTTCTGCACCTAAGACAATACTTGCCAAAACTCCTCTACCATC
CATAATTCCACCAGCGGCAATGACCGGAATTGAAACGACATCTACAATTTGTGGCACTAA
AGATATTGTTCCAACCATAGGTAATTGATTTTTAGGTTTTAAAAATGAACCACGATGTCC
ACCTGCTTCACTACCTTGAGCAACGATAGCATCCATACCCGCTTTTTCATTCGCAATAGC
TTCATCAACACTTGTTGCTGTACCTATAAGTTTGACATTCGCTGCTTTCAACCTGCTTAT
AATCTGTTCGCTTGGAATTCCAAAAGTAAAACAACATACAGGCACTTGCTTTTTAATTAT
CGTATCAATATGACACTTAAATTGTTGTTCTTCGGTAATTTTTACAACCGGCTCTTCTAA
ATGTAATGCGCGTCGATAAGGTTTTAACCATGCATTCATATTTTCAATTTGACTACTGGT
ATATGATTGTTGACTTGGTACAAAGACATTTACGCCAAAAGAATTTGACGTTAATTGGCG
TACATAATCTATTTCATCTTCCAATTGCTGCGTATTAAAGTAACCTGCGCCTATTGTGCC
TAACCCACCACTGTTACTTACTGATGCAACTAATTTCGGTGTCGTACTTCCTGCCATACC
TGCTTGTATAATTGGATATTCAATACTTAACATTTGAGTAAGTCGATTCTTATTCCACAT
AGCTGTTCGCTCCTTATATAGATACGTTGCGATTTTTCCGTTGTTGAAATTGAATTTGCT
GTTGAGAAAGTTTTTCTTTTTCCTTTTTATCCATCTCATCTTCAATTTCCATACCTAATA
ATTCTTCAATTAAGTCTTCATGTGACACTATCGCTTCAGTACCACCAAATTCGTCCAACA
CAATTGCTAAATGTTTTCTAGAAATAGTCATCTTACGTAATACCCATTCAGCTTTATTGT
GTTCATTCACAAATAATGGCTTAGCTGAATAGTTTGTAATTTGATTTTCTTTTTTATTAC
TCCAAGCCAACAGATATTTAGAATGAAACACCCCAATAATGTTATCAATATCTCCCTCGT
ACACTGGATATCTAGTGTATGGCTTATTCATAACCGTTTCATAAACTTCTTCGTATGTCG
CATTTGAAGCAAATGCCGTCACATTAATTCTAGGTGTTGTATCTACATCTTTTACTTTTA
AATTTTCAAAATTAATGACACCTTCCAACCTACTCGTCTCAATTTCATTTAAAGCACCTT
CATGTCCAGCAATTGCTAACATTGTTTTAAATTCTTCTTTTGAAAATTGATGTTCTTGAG
GTTGGCCCTTAGATAAACTTCGATTAATACTGTCCGTCAACTTATTTAAAAGTAATGTGA
TAGGACGGAACACAATGACACAAATATTAATAATTGGATATACAAGCCTTGTTATTTTAT
CTGGAAATGTTGCAGCGACAGACTTGGGAATCACTTCGGAGATCAAAATGATAACAACTG
TTAAAACAGCTGATGCAATACCAACGCTAATCCCCCAACGTAAAGCCATAATTGTAACAA
GTGTTGGTAATAAAATATTCGCGACATTATTCCCAATTAGAATCGTTGTAATAAACTCAC
TTGGTTTTTCAAGTAACTTTACAATGCCTTTTGCTTTTTTATCACCTTTGTCAGCTTCAG

TTTTAAATTTTGCTTTATTGGCAGCCGTTAATGCCGTCTCGCTTCCTGAAAAGAAAAACG
AAATAAATATCAATATAATTATGGCAATGATC
LOCUS 79
GATCTTCAATTTCACAAGGAATCCATGATTGAATTTGCTTTAATGTAACATTAATCATAA
TAACAACCTCAGTTAGTCAATTTTGTATTTATTTTTCTGTTTATCCTGGTGACGTTCTTT
AGCAAGCTCGATAAGTTTTGTAATCAATTCTGGATAAGATAAGCCCATATTTTCCCATAA
CTTTGGATACATACTGAAAGCCGTAAATCCAGGCATTGCATTTGTTTCATTAATATATAT
TTGGTTGTCTTCTGTTACAAAGAAATCAGCACGGACTAAACCAGAACAATCTGTCGCTTT
GAATGCCTCTAATGCCATATTTCTAAGCGTTAATTGAACATCTTCGTCTAAGTCAGCTGG
AATTTGTAATTGAACCTTACCATCTTTATATTTTGATTTGTAATCGTAAAACGCGACATC
TTTTACGACTTCACCTGGCCATGTCGCTTCAGGATAGTCATTTCCTAAAACTGCTACTTC
AATTTCACGTGCGTTAACGCCTTGTTCTATAACAAGCTTACGGTCAAATTGGAATGCTTC
TTTAATACCTTCTTTAAGTTCCGCTTCATTATTACATTTACTGATACCTACACTTGACCC
TAAGTTAGCAGGTTTAACAAAGACTGGGTAATTTAATTTATCATTTACTAATTTTAAAAT
GTTATGTTCATATTTTTCATATTCAGAACGTAAGAAACTAATATAAGGTAACTGTGGTAA
CCCTCGATGTTCAAATAATTGTTTCATTACAAGTTTGTCCATAGAACTTGCAGCTGACAA
TACACCATTTCCTACATATGGTACATCCAAAACTTCAAAAAGCCCTTGAATCGTGCCATC
TTCACCATTAGGACCATGTAATAATGGGAATACTGCATCGTATGGTTGTCCTGAACTACT
TTCTTTCAATAGCTGTGAAATCTCAAGCGCCTCTCCATTTTCTAAATGAAGCTCATCAGT
AGATTTAATTTCAGCTGTAATATTATTTTGCTTTCTCCAATCACCATCATTGGTAATATA
AATGATATCAACATGATATTTGTCTTTATCTATTGCATTTAATACATTTTGTGCTGTCAG
AATCGATACTTCGTGTTCTGCACTTTTCCCTCCAAAAACGATACAAATATTTTCTTTTGT
CATTTCGTTTTCCTCCAATGATATATCAGGGTTTGCTACCTTAATATAAATTAATATTGA
TTTAGTCCTATTGTTAATTGATTTATTCGCATCTTTGAATCTTAATAGTATCACATTTTA
ATGCTATTTTGCATTTTAAAAACGAGGACTTATGTGTCTGTATCTATGTTGATTCATTTA
TAATCAGAACAATATTCCCTTCTATTTTATTCCTAATTCAAATTGAAATCTATAGCTGAT
ATCACTGTGATATTCTAGCTAATTTTTAAAAAGTCATGTAAAATTGATATAAACATTAGT
GAGTATAAAAGGAGTTTGCAATGAATTATTCATCTCGTCAACAGCCGGATAAGCATTGGC
TTCGCAAAGTAGACTGGGTATTAGTAGCCACTATAGCTGTTTTAGCAATTTTCAGTGTTC
TGCTTATTAACTCGGCAATGGGCGGTGGTCAATACAGTGCTAATTTCGGTATCAGACAAA
TTTTTTATTACATTTTAGGTGCAATTTTTGCAGGTATCATCATGTTTATTTCACCTAAAA
AGATTAAACATTATACATATTTATTGTATTTCTTAATCTGTCTATTATTAATAGGCTTGC
TCGTTATTCCTGAGTCACCTATTACACCTATTATCAATGGTGCCAAAAGTTGGTACACGT
TTGGCCCTATCAGTATTCAGCCATCTGAATTCATGAAAATTATTTTAATTTTAGCATTAG
CGCGTGTCGTTTCTAGACATAATCAATTCACATTCAATAAATCATTCCAAAGTGATTTGT
TATTATTTTTCAAAATTATTGGTGTCTCGTTAGTACCAAGTATTTTAATATTACTGCAAA
ATGACCTAGGAACTACATTAGTATTAGCTGCTATTATTGCAGGTGTGATGTTAGTAAGTG
GTATAACATGGCGTATCTTAGCACCTATCTTTATTACAGGTATTGTTGGTGCAATGACAG
TCATTTTAGGTATTCTATATGCACCCGCATTAATTGAAAATTTATTAGGTGTCCAACTGT
ATCAAATGGGACGAATCAATTCATGGCTTGACCCCTATACATATAGTAGTGGTGATGGCT
ATCATTTAACTGAATCACTTAAAGCTATCGGTTCTGGACAGTTACTAGGTAAAGGATACA
ATCACGGTGAAGTTTATATACCTGAAAATCATACTGACTTTATCTTTTCAGTGATTGGAG
AGGAACTTGGCTTTATCGGTTCTGTCATATTGATCTTAATATTTTTATTTTTAATCTTCC
ATCTAATAAGATTAGCTGCGAAAATTGAAGATCAATTTAACAAAATCTTTATCGTTGGTT
TCGTCACTTTACTTGTGTTCCATATTTTACAAAATATTGGTATGACAATTCAGTTGTTAC
CAATCACTGGTATTCCATTACCATTTATTAGTTATGGTGGTAGTGCGCTATGGAGTATGA
TGACTGGAATAGGTATAGTCTTATCAATTTATTATCATGAACCAAAACGATATGTCGATT
TATACCATCCAAAAAGTAATTAATTTAAACTATTTTGAGTTTCAAATATCATAACTTTTC
AAGATGACGTTATATAGTCTATTTACGTCGTCGATTTAAAATGTCATATATAGATATTAC
TCGATAATAACAATCCCTCTTTGAAGTACACATTGTAAAATGTACACTCTAAAGAGGGAT
TTTGTTATATAGTACTTGCTTTCATTTTAGTAAATCCAGTCAAAAAAGCTATCATCGAAT
AGTCCGACGATAGCTTTAACGGTGTGTGATTCACAATCACAGTCAATTATTTTAATTCGT

GACTTACTTTATTAGATGCTGGCAAAGTATTAATAATGTCTAAACGAGATTTAGTTTTTT
TAATATTCACACCTAATGATGACAATAGTTTGACTACATTTTGAATCTTTTCAGGACGTT
TCATTATTATCACCTCGTTTGGATC
LOCUS 80
GATCATGGCA
TTGTATTTAATGCAAGTCTACCTTTGTACAAAGATGCCATCCATCAAAAAGGATCAATGC
GCAGTAATGACAATGGTGATGATATGAGTATGATGGTGGGTACAGTGCTGAGTGGCTTTG
AATATCGAGCGCAAAAAGAAAAGTATGATAACTTATATAAATTCTTCAAAGAAAATGAAA
AGAAATATCAATATACAGGCTTTACAAAAGAGGCAATTAACAAGACACAAAATGTCGGAT
ATAAAAATGAATATTTTTATATTACATACTCTTCTAGAAGTTTAAAAGAATATCGAAAGT
ATTATGAACCACTGATTCGAAAAAATGATAAAGAATTTAAAGAAGGAATGGAACGAGCAA
GAAAAGAAGTGAATTACGCTGCAAATACAGATGCTGTTGCTACACTTTTTTCTACTAAGA
AAAACTTTACTAAAGACAATACAGTAGATGATGTAATCGAACTAAGTGATAAATTATATA
ATTTAAAAAATAAACCAGATAAATCTACAATCACAATACAAATAGGGAAACCCACTATTA
ATACTAAGAAAGCCTTTTATGATGATAATCGTCCAATAGAATATGGGGTGCACAGTAAAG
ATGAATAAAATTAATGATAGGGATTTAACAGAATTAAGTAGTTACTGGGTTTATCAAAAT
ATTGATATAAAAAAAGAATTTAAAGTTAATGGAAAAAGGTTTAAACAAGTAGACAGTTAT
AATGATGATAAGAATAGTAATTTGAATGGTGCTGCTGATATTAAAATATATGAGTTATTA
GATGATAAAAGTAAACCAACTGGTCAACAGACAATAATTTATCAAGGAACATCTAATGAG
GCAATTAATCCAAATAATCCATTAAAATCATCGGGGTTTGGAGATGATTGGCTCCAAAAT
GCTAAATTAATGAATAATGATAATGAAAGCACAGATTATTTAAAGCAAACAGATCAATTA
TCAAATCAATATAAAATAAAGTTAGAAGATGCAGATAGATTATCAAATAGTGATTTTTTA
AAAAAATATAGAATGGAATCAAGTAACTTCAAAAACAAAACCATTGTGGCGGATGGCGGT
AATTCGGAAGGCGGTGCAGGAGCAAAATATCAAGGAGCGAAACATCCGAATGAAAAAGTT
GTTGCTACTGACTCAGCAATGATTCCTTATGCTGCTTGGCAGAAATTTGCTAGACCACGC
TTTGATAATATGATTAGTTTTAATAGTACCAACGATTTATTAACATGGTTACAAGATCCA
TTCATCAAAGATATGCCAGGAAAACGCGTTAACATTAATGATGGTGTGCCCAGGTTAGAT
ACTTTAATAGACAGCCATGTAGGTTATAAAAGGAAGTTAAATAGAAAAGATAACACATAC
GATACTGTACCACTAATCAAAATAAAGTCGGTAAAAGATACAGAAATTAAAAATGGAAAA
AAAGTAAAAAAAGACTATTAACATAACATTAGATATGGATGGGCGAATTCCAATAAATGTT
TGGACAGGAGATTCGATTGCACGTTCTGGAAGAGGAACTTTAATTAAACTTAATTTAGAA
AATCTTGATGCGTTGAGTAAACTGATTACTGGTGAAACAAGTGGTATGTTAGCAGAATGC
GTAATCTTTTTAAATGAAAGTTTTAACATCTCAGAAAATGAAAATAAAAATTTTGCAGAT
AGAAAGAAACAATTATCAGAAGGATTTAAGGATAAGATTAACTTATTTCAGTTAGAAGAA
ATGGAAAGAACTTTAATTAGTAAAATAAACTCACTTGAAGAAGTTGCAGATGAAACAATA
GAAAGTATTAGTGCTGTTAAACACTTATTACCTGATTTTGCATTGGATGCATTAAAAGAA
AGAATTAATGAGTTGTTTAAAGGTATAAAATCTTTTATAGAAAAAGTGTATGATAGTATA
GATAATGAAATTTTAGAAATTTTCAAAAATATAGATCACGACTTCAGAGATGGAGTATCT
GAAGAAATGAT
LOCUS 81
TGACGCTGCTTTTGTAAATACATATAATTTTTCCACTTCATGATTTAATTCGTTCGCATG
ATCTTTGTAATTTCTACCAAAAGCAATCACATTATTCGGAGGTGTTACTGGTGGTAAAAA
TTCAATGTCATTAAATGAAATTTTATAGTCTTCAGCTTTGCCGCTATCTTCTGCTGCTAC
AACTGCTTTACGTACTTGTTCTTGAAAATCTAAAGTATGATTTTGTTGTAAACCAGCTAA
CAATGTTTTAGGATGGAAATCTCCTTCTGCAAAGTCAGCAAATACTTGTGTTAAATCCCA
TACAGCATCTTCGCGTTTTACTTTAACGCCATATGAAGTTTTGTCATTATACTTGAATGA
TAAGAATTTCATTCATTCTCAACTCCTCGTCTTTATCTTAATTCACATTATAACTTTTTT
CGTTATCAAATAACAAATAAATAAGTAAGACAATTTTGAAAATGAGTTGTGTTCATTCTG
CTACAAGGACTTTGCACTTAATCGAAATTATTTTTTATTCTTTTGAAAATCAAAATACTA

TAGTTGCAATGTACCAAATTTGAAGAAGTATAAATAACCTTTAACTTCTTTATTAAGAAT
CGTTTGAAGCGTATTTTGATAATATTTCATCTGTATCTTATATTTATTTTTTAATTGTGT
ACCAATTTCTTCATCTGTCATCCCACGGCGACGATTAAATGCATCGGTTTTATAGTCTAC
AAAATAATGCACACCATCTTTAACAAAGATTAAGTCAATCATACCTTGAATAATTGAGAC
GTCTTCGTCTCCTTGTGGCAATTGGTCAACTAATGCTTGGTTAACTACAAACGGTAATTC
ACGATAAACTTGCTCTGCTTCAGCAATAATCGAATATAACTCACTATTGATAAATGTCAT
TATTTCATCCATACGGATATCTTTTTTCGCATCTGCTTCGATAATATGTTTATCGATTAA
TCCATCGATATACTGATGTAACTCAACTTCAGATATGCGTTCTTTTTTGAATGGTAAATG
TTGCATCACTGTATGCATTAACGTACCAATTTCATTCGCTTTTCGTTTACCTTGTTCACT
TAGAAATTTAGGTCGTTCATACGTTGAAAAACCGATACGATATTGCCTTACTCGTTCGTA
ACTTGTGCCACTTTCTTCTGTTTCATATTGTCTTTTCAATTCAGAAACAGATTGTTTTGA
GGGCTTTTTAGTATCATTTACATATGGATATCGATAATCAAGTTGGTGTTTAATTTGTGC
TTTAACATCTTCATTACCATTTTGCATAGTTTCTAATTGATTAACCGAACGATATTCATC
ATTATCTAAAATGGTTTCTGTAGACACATCTTCAAAGTACACAATTGAAATATTTACATT
CGGACGACTACTATCTTCAATTTGTGCTATATCTTTTTCAAATTTTAAATCATCTGGAAT
TGACGCAGATTGATGTTTAGATAAAATACTATAAATAAGATGGAACGGATTTGGTGAAGT
TAATCGTTCATTGACAGCAATGTGCTCACCAGAAATAGACAATTGCTCTAGTTCTAGTAA
TGATTTATCATTTTTCACTCTACCAATTAAATAAAGTTGTTCTTTCGCTCTTGTTAATGC
TACATAGACTAATCGCATTTCTTCTGACACAAGTTCTTTTTCGGCAACAGCTCTATATGC
AACCGAAGCTAAAGATGGAAATGCCATTTCTTTATCCACATCAAAATAATCCATTCCGAG
ACCAAATTGCTGATTTAAAATAACTGGTTGTTTCAAATCACGTTTATTAAAATCTTTTGA
CAATCCAGAATAAATGACAAATGGAAACTCTAGACCTTTACTACTATGAATTGTCATCAT
TCTAACGACATTATCGTTTGGACCAACTACATTTTCCTCACCAAAATCTTTGCCTCTTTC
AATCAATTCATCGATAAAACGAATAAATTGATATAAACCTCTAAAACTTGAATTCTCAAA
CTCGATAGCTTTATTAAATAAACCATAAAGATTTGCACGTCGTCCACGTCCACCAATAAG
TCCACTAAAGTATTGAATAACATAATGATC
LOCUS 83
GATCAACTTAATATAATG
AATTCGGCAACAGAAGAGCATCATCATAAAGATTATATTAAACTATATAATTTAGGTGGC
GGTGCTGCTAAAAAAATTGCAATAGAGGTTTTATTGGGGAAGGATAAAGTCATTCAGAAA
AAATACGTGCATATTTTACCTAGTAAAGAAGGGTACATGTTACCAATTAATAAAAATGTG
TACGAAGAATTAGAAAGAACGATTGAGAACAATGGTCATGAAGCTGATTTGAATGTACGT
ATGACTTATTATCATAATGTAAGTCGCAAACAACAGGAAGTTATATTAAAAGGTCAAATC
GACCGTTTTAATACTTATAATAATAAAGAAATTTATGATTTGCAGTTTATCTAAAAATTG
ATTTAAGAGGGTAGTTGTTTATTGCGAAAAATATCATTCAATTTTAATGAAATAATGGCG
TCATTACTATAAAATATTACTTTATGTTGTAATGCATTTTTCTATAAGATAGAACTAAAA
GGAGGGGCAAAGATGCAAATTAGACAAATACATCAACATGACTTTGCTCAAGTGGACCAG
TTAATTAGAACGGCATTTGAAAATAGTGAACATGGTTATGGTAATGAATCAGAGCTAGTA
GACCAAATTCGTCTAAGTGATACGTATGACAATACCTTAGAATTAGTAGCTGTTCTTCAA
AATGAAGTTGTAGGGCACGGTTTACTAAGTGAAGTTTATCTTGATAACGAGGCACAACGG
GAAATTGGATTAGTGTTAGCACCTGTATCTGTTGATATTCATCATCAAAATAAAGGTATT
GGGAAGCGATTGATTCAAGCATTAGAACGAGAAGCAATATTAAAAGGATATAATTTTATC
AGTGTATTAGGATGGCCGACGTATTATGCCAATCTAGGATATCAACGCGCAAGTATGTAC
GACATTTATCCACCATATGATGGTATACCAGACGAAGCGTTTTTAATTAAAGAATTAAAA
GTGAACAGTTTAGCGGGAAAAACAGGTACCATAAATTACACATCTGCTTTTGAAAAAATA
TGATTTCAAGCTAGGATTACATTAGGTAGAGTTCATATTAATAATAAAAAATGTTTGCAA
TCAAATCGTACGTTGTCGTTTGTAATTCTTAAAATAGCAATAAATAAAATGTTTGTTAGT
AAAGTATTATTGTGGATAATAAAATATCGATACAAATTAATTGCTATAATGCAATTTTAG
TGTATAATTCCATTAACAGAGATTAAATATATCTTTAAAGGGTATATAGTTAATATAAAA
TGACTTTTTAAAAAGAGGGAATAAAATGAATATGAAGAAAAAAGAAAAACACGCAATTCG

GAAAAAATCGATTGGCGTGGCTTCAGTGCTTGTAGGTACGTTAATCGGTTTTGGACTACT
CAGCAGTAAAGAAGCAGATGCAAGTGAAAATAGTGTTACGCAATCTGATAGCGCAAGTAA
CGAAAGCAAAAGTAATGATTCAAGTAGCGTTAGTGCTGCACCTAAAACAGACGACACAAA
CGTGAGTGATACTAAAACATCGTCAAACACTAATAATGGCGAAACGAGTGTGGCGCAAAA
TCCAGCACAACAGGAAACGACACAATCATCATCAACAAATGCAACTACGGAAGAAACGCC
GGTAACTGGTGAAGCTACTACTACGACAACGAATCAAGCTAATACACCGGCAACAACTCA
ATCAAGCAATACAAATGCGGAGGAATTAGTGAATCAAACAAGTAATGAAACGACTTCTAA
TGATACTAATACAGTATCATCTGTAAATTCACCTCAAAATTCTACAAATGCGGAAAATGT
TTCAACAACGCAAGATACTTCAACTGAAGCAACACCTTCAAACAATGAATCAGCTCCACA
GAGTACAGATGCAAGTAATAAAGATGTAGTTAATCAAGCGGTTAATACAAGTGCGCCTAG
AATGAGAGCATTTAGTTTAGCGGCAGTAGCTGCAGATGCACCGGCAGCTGGCACAGATAT
TACGAATCAGTTGACGAATGTGACAGTTGGTATTGACTCTGGTACGACTGTGTATCCGCA
CCAAGCAGGTTATGTCAAACTGAATTATGGTTTTTCAGTGCCTAATTCTGCTGTTAAAGG
TGACACATTCAAAATAACTGTACCTAAAGAATTAAACTTAAATGGTGTAACTTCAACTGC
TAAAGTGCCACCAATTATGGCTGGAGATCAAGTATTGGCAAATGGTGTAATCGATAGTGA
TGGTAATGTTATTTATACATTTACAGACTATGTAAATACTAAAGATGATGTAAAAGCAAC
TTTGACCATGCCCGCTTATATTGACCCTGAAAATGTTAAAAAGACAGGTAATGTGACATT
GGCTACTGGCATAGGTAGTACAACAGCAAACAAAACAGTATTAGTAGATTATGAAAAATA
TGGTAAGTTTTATAACTTATCTATTAAAGGTACAATTGACCAAATCGATAAAACAAATAA
TACGTATCGTCAGACAATTTATGTCAATCCAAGTGGAGATAACGTTATTGCGCCGGTTTT
AACAGGTAATTTAAAACCAAATACGGATAGTAATGCATTAATAGATCAGCAAAATACAAG
TATTAAAGTATATAAAGTAGATAATGCAGCTGATTTATCTGAAAGTTACTTTGTGAATCC
AGAAAACTTTGAGGATGTCACTAATAGTGTGAATATTACATTCCCAAATCCAAATCAATA
TAAAGTAGAGTTTAATACGCCTGATGATCAAATTACAACACCGTATATAGTAGTTGTTAA
TGGTCATATTGATC

LOCUS 84

GATCAGATTTATTAGACAGTATTCCAGATATACCCACACCAAAGCCAGA
AAAGACGTTAACACTTGGTAAAGGTAATGGATTGTTAAGTGGATTATTAAATGCTGATGG
TAATGTATCTTTGCCTAAAGCGGGGGAAACGATAAAAGAACATTGGTTGCCGATATCTGT
AATTGTTGGTGCAATGGGTGTACTAATGATTTGGTTATCACGACGCAATAAGTTGAAAAA
TAAAGCATAATTATATTGGGGGAAGAGCATCTATATATTTTTTTAAGTATATAAGACGTC
TTATTTCCCCTTAATTTATTGTGAAGTATATGCAAAATGCAATGAATAGATTGTCCATCA
TTTTAACGTTATAATGAATTTAACGACTTAGAACTACACAAGTAAAGGAGAATGAAGATG
TCTCGAAAAACGGCGCTATTAGTTTTGGATATGCAAGAAGGTATAGCGAGTAGTGTACCT
AGAATAAAAAATATTATTAAAGCGAATCAGAGAGCAATTGAAGCAGCAAGACAACATCGA
ATACCAGTCATTTTCATACGTTTAGTGTTAGATAAGCATTTTAATGATGTCTCCTCGAGT
AATAAAGTGTTTTCAACAATTAAAGCTCAAGGATATGCGATTACTGAAGCAGATGCATCT
ACACGAATACTTGAAGATTTAGCACCACTAGAAGATGAGCCGATTATTTCTAAGCGACGC
TTTAGCGCATTTACAGGTAGTTACTTGGAAGTTTATTTACGTGCAAATGATATTAATCAT
TTAGTATTAACGGGTGTCTCTACAAGTGGAGCTGTATTGAGCACGGCATTAGAAAGTGTA
GATAAAGACTATTATATTACTGTTTTAGAAGATGCTGTTGGTGATAGATCAGATGATAAA
CATGACTTTATTATTGAACAAATTTTATCACGCTCATGTGACATTGAATCCGTAGAGTCA
TGGAAAAGTAGTTTATAGTTAATATAACGTCAATTAAAGCTCGGCAGTAATGTTTGAGAA
TAAGTACATTTGCTCATATTTATAAAATGTGTGAGATGGCAATTGAAACGGATATGATGA
GGAACATTTGAACATAAAATAATATATTTATATAAAACGACCCGAGGCGTTCGAACTGAA
TGCCTCGGGTTTAATTGAATAAGAAATCGGACTTATGAACAGAAATATGTTTAAGTCCGA
ACTCCTTGTTTATACTTATAAATTTTACGGGTTTAATATAATACTTATTTACCTGTAATA
TATGATAATTCTTCAGCGGCAGCTGCGTTGATAGTTCTATGAGAAATGATACCTAATCCT
TTAACATTGGATTCTGAAATAACGATAGAACCATCACTGTTAACTTTTTCAACAAATGCT
ACATGACCGTAATGTTGATCTGCACCAAATTGTCCAGCCTCAAATACAACAGCAGCATGA
CGTTTTGGTGTATGACTTACTTGATAATCACGGTATTGAGCTCGATTATTCCAATTATGT

GCATCACCTAAATCACCTGAGATAGATGTACCAAATTGTTTCATACGGTTATATACGTAC
CAAGTACATTGGCCATGTGGATATGGCATACTATCAGATACCTCACGGAAAGGTTTGAAT
TCATCTGATGAATCATCATAATCCTTGATAGAACGTTCATATTTATCTAAATCTGGCATG
CGTTCATCGTCAAACTGAGTTAATTGATAGTGTTTAATAATACTGTTTAATTTCTTAGCA
TAGTTTGGATCTGTAGCATATGTTTTAGATAAGTGTGATGTTGCATCTTTATAAGAATCG
GCTTCCGATTTCCATGTTGGTTTATAAATTGTTCGATTGCCATCAATACCATTTTTAATA
AGGTCAGAGTAATCTTTTAGTGATTCTTTCGTGCTTGGATATTTTCGGAATCCAGCATTA
ATACTATACAATTGATTACCATCAGCTTCTAATGTGTTAAAAGGAACAGAATTCCCTTCA
AAAGCACCTTTGATACCGAATAAATTATGGTTTGGTGACTTAGCTAAAGCACTACGACCT
GAGTCAGATTCTAAGATTGCTTGGGCAATCATGACAGACGCATAAATATCGTTATCTTGA
CCAATGCGATGTGCATCTTTAGCAATTGATTTGACAAATTGACGTGTATCTTTTGAGTCA
ACAACGTTAAATTGTCCGCTATCATCATTGTTAGATATACTAGGATCTGTTTCGAATAAT
GATGTTGCACGTGTATCCTTTTGATTAACATCGTTATTGAATGATTGAGCAGGTTTAGAT
TTATGTTTCAATTCATCTTGTGTTGGTAACTGTGGATTCTTTGTATTAGATTTTTCATTT
TTGTCTTTTTTAGATTGAGATGCATAATCTTTTTGTGTTTTCTTTGCATCTTCACTGTAT
TGATC
LOCUS 85 (F126)
TGGATCATTATATAATGCTGGATAATCATCGTTATATTCTAAGGTGCAAGTTACACCATA
CATATCCTCTAATCCTTTTGATAAACGTTTAATTTCTTTTTCAATTGTTGCTTTTGTAGC
ATCTGTTAATCCACGTACATCACCTTCAATTTCAACAACATCTTTAATGACATTGAATTG
ACCTTTACCGTCAAATGAACCGATTGTGACAACACCGGTTTCAAATGGACTTAGTCGTCT
AGATACAACTGTTTGTAACGCTGTGACGAAGTAGCTACCTGCAACAATGGCATCATTGGC
CATATGTGGTGATGAACCATGACCACCTTTACCTTGAACTTTCAATTTGAAGAATGCGCG
TCCTGTTTGAACATAACCAGGTCTGTAATACACTTTACCTGTTTTCATTGTGCTCATGAC
GTGTACACCTAATACATGATCAACACCGTCTAATACACCATTTTCAATCATTGTTTTAGC
ACCACCTGGTGGTACTTCTTCAGCTGGTTGATGTATCACAACGACTTTTCCTGTAAAACT
ATCTTTCATTTCAGCAAGCGTCTCTGCTAATACAAGCATGTATGCTGTATGTGCATCGTG
ACCACATGCGTGCATAACACCTTTATTTTGTGATGCAAAAGATAATCCTGTATCTTCAGT
AATGGGTAATGCGTCAAAGTCTGCACGGATTGCTAATGTTTTACCAGGTTTCCCTGAATC
AATCGTTACTTTAATTCCACGTGGTCCGACATTCGTTTCTACTTCCACATCTTTACCTTT
GTAAAATTCAGCGATGTATTTCGCCGTTTCATCTTCATGAAAAGATAATTCTGGATGCTG
ATGTAAATAACGT
LOCUS 86
CCTGTGTAAGCGTGAATTGTAGTCATTAAACCTTCAACTAAACCAAAGTCATCGTTTAAA
ACTTTAGCAACTGGTGCTAATGAGTTTGTAGTACATGAAGCACCTGAAACAACTGTTTCA
GAACCGTCTAACTCTTGGTGGTTAGTGTTGAATACGATTGTTTTTAAGTCACCAGTAGCT
GGTGCTGAGATTAATACTTTTTTAGCGCCTGCTTCAATATGAGCTTGTGCTTTATCTTTA
TCAGTGTAGAAACCAGTACATTCTAATACTACATCGATATTTAAGTCTTTCCAAGGTAAT
TTGCTTGCATCTGGTTCACTGAATGATTTAACTTCTTTACCATTTACGCGGAAACCACCA
TCAACTACCTCTACTTCACCTGTGAAACGACCTTGCATAGTGTCATATTTTAATAAATGC
GCTAACATGTCGTCATCTGTTAAGTCGTTTACTGCTACAACTTCAAGACCTTCTACTTCT
TGAATTCTTCTGAATGCTAAACGACCAATTCTACCAAAACCATTAATTGCTACTTTTACT
GCCATTATAATGGCCTCCTTTAAAATGATATTTAAAAAGTATTAAACTTTTTATCTCTTA
TTCAAGTATTATCTTTGCTGCGGCTTCATCAGTGATTAACACTGTATTCTTGGGTGCAAT
CGTCAAGTATGCTTTAATTGCTTCACCTTTCGATTTGCCTCCTGCAACTGCAAAAATAAA
GTCTTTTGATTCAAGGTCTTCTAATTGAAGTCCAATTGTTTTAACCTTATGGACAATTTG
ACCTTGTGTATCAAAATAATAACCAAATGCCTCTCCGACAGCTTGATGATGTTGAAGTTG
TTCAATGACCTTTTCAGGTGATTGACGTCGATGCGCCATCTTCAGCGCATCACCAATGCC

GTGTAATATAACGTTTGCTTGTTTAATTTTGTCTAAAGTGTTTATGACTGATGGCTCTAA
CAACAATGTATTATATGTTGTTTCACTGACATTATCAGGTACATACATCGTCGTATAATA
ACCGCCAGCTTGTTGTGCCATACTGGCTGCAATTGTGTTTGCCTGAAAGACAACATTTTC
GCCTAGTCCACCTCTGGCTGGTACGAAGAATACATTATATGGTAATAAATGAATTGCTTC
ACTAACACATGCCATCGTGGATCC
LOCUS 87
TGACGCTGCTTTTGTAAATACATATAATTTTTCCACTTCATGATTTAATTCGTTCGCATG
ATCTTTGTAATTTCTACCAAAAGCAATCACATTATTCGGAGGTGTTACTGGTGGTAAAAA
TTCAATGTCATTAAATGAAATTTTATAGTCTTCAGCTTTGCCGCTATCTTCTGCTGCTAC
AACTGCTTTACGTACTTGTTCTTGAAAATCTAAAGTATGATTTTGTTGTAAACCAGCTAA
CAATGTTTTAGGATGGAAATCTCCTTCTGCAAAGTCAGCAAATACTTGTGTTAAATCCCA
TACAGCATCTTCGCGTTTTACTTTAACGCCATATGAAGTTTTGTCATTATACTTGAATGA
TAAGAATTTCATTCATTCTCAACTCCTCGTCTTTATCTTAATTCACATTATAACTTTTTT
CGTTATCAAATAACAAATAAATAAGTAAGACAATTTTGAAAATGAGTTGTGTTCATTCTG
CTACAAGGACTTTGCACTTAATCGAAATTATTTTTTATTCTTTTGAAAATCAAAATACTA
TAGTTGCAATGTACCAAATTTGAAGAAGTATAAATAACCTTTAACTTCTTTATTAAGAAT
CGTTTGAAGCGTATTTTGATAATATTTCATCTGTATCTTATATTTATTTTTTAATTGTGT
ACCAATTTCTTCATCTGTCATCCCACGGCGACGATTAAATGCATCGGTTTTATAGTCTAC
AAAATAATGCACACCATCTTTAACAAAGATTAAGTCAATCATACCTTGAATAATTGAGAC
GTCTTCGTCTCCTTGTGGCAATTGGTCAACTAATGCTTGGTTAACTACAAACGGTAATTC
ACGATAAACTTGCTCTGCTTCAGCAATAATCGAATATAACTCACTATTGATAAATGTCAT
TATTTCATCCATACGGATATCTTTTTTCGCATCTGCTTCGATAATATGTTTATCGATTAA
TCCATCGATATACTGATGTAACTCAACTTCAGATATGCGTTCTTTTTTGAATGGTAAATG
TTGCATCACTGTATGCATTAACGTACCAATTTCATTCGCTTTTCGTTTACCTTGTTCACT
TAGAAATTTAGGTCGTTCATACGTTGAAAAACCGATACGATATTGCCTTACTCGTTCGTA
ACTTGTGCCACTTTCTTCTGTTTCATATTGTCTTTTCAATTCAGAAACAGATTGTTTTGA
GGGCTTTTTAGTATCATTTACATATGGATATCGATAATCAAGTTGGTGTTTAATTTGTGC
TTTAACATCTTCATTACCATTTTGCATAGTTTCTAATTGATTAACCGAACGATATTCATC
ATTATCTAAAATGGTTTCTGTAGACACATCTTCAAAGTACACAATTGAAATATTTACATT
CGGACGACTACTATCTTCAATTTGTGCTATATCTTTTTCAAATTTTAAATCATCTGGAAT
TGACGCAGATTGATGTTTAGATAAAATACTATAAATAAGATGGAACGGATTTGGTGAAGT
TAATCGTTCATTGACAGCAATGTGCTCACCAGAAATAGACAATTGCTCTAGTTCTAGTAA
TGATTTATCATTTTTCACTCTACCAATTAAATAAAGTTGTTCTTTCGCTCTTGTTAATGC
TACATAGACTAATCGCATTTCTTCTGACACAAGTTCTTTTTCGGCAACAGCTCTATATGC
AACCGAAGCTAAAGATGGAAATGCCATTTCTTTATCCACATCAAAATAATCCATTCCGAG
ACCAAATTGCTGATTTAAAATAACTGGTTGTTTCAAATCACGTTTATTAAAATCTTTTGA
CAATCCAGAATAAATGACAAATGGAAACTCTAGACCTTTACTACTATGAATTGTCATCAT
TCTAACGACATTATCGTTTGGACCAACTACATTTTCCTCACCAAAATCTTTGCCTCTTTC
AATCAATTCATCGATAAAACGAATAAATTGATATAAACCTCTAAAACTTGAATTCTCAAA
CTCGATAGCTTTATTAAATAAACCATAAAGATTTGCACGTCGTCCACGTCCACCAATAAG
TCCACTAAAGTATTGAATAACATAATGATC
LOCUS 88
GATCCTCTAAAGTGATTGTCCCACCACATGCTTTGACAACATTGACTAATTGTTTCGCAA
TGTCACCTTTATAAAATGCATTAAACCCTTGTTCTCTTAATATTTGAAATGTCTTACCTA
ATTCGGGTTGTACAATCCAATCACCTTCACGCCAATATTGATTTTCATGCGTAAATACTT
GTGCCGTTTCATGATACTTTGTCAATCGTGCGTGTTGCTGGCGCGAATATTTTTCAGTAG
CCCAATTGGCTGCATGACCTTCAATGGCTAGTTCAATTGCAGGATTAATTAAATCTTCCA
ATGACAATTTAGCATAACGCTTGTGAATATAATCAAACAGCTTTGGAATTGCTGGCACAG
CGACAGTTTTACCATGTGTAGTCATATCAAAAAATGATTTATATTCGCCTGAATCATCTA
GATAAAATTGTTTGTCTACATGTTCAGGTGCTGTCTCACGTGCATCAAACGCAGTTATAC
TGCCAGTACTTTGCTCATAATATAGCAAATACCCGCCACCACCAATACCTGATGCAAATG
GTTCTACCACATTCAATGCCAGTTGAATTGCAATCACTGCATCCATGGCGTTGCCACCTT

GATCTAATACATCCTTACCAATTTTAGCCGCAAGAGGATGTGATACGGAAATTAACCCTT
CTTTAGATGTTTTTGTCTGTTTGTCATTTAAGTTAATGACCATACTATATCCTCCTACTT
TCTGTTAAATATTTAAAACATTATTGATTAATGGCTTTTTCTACTTTTTCTAAATCTTGA
CGTTGCTCGTTACCAGTATCGACAAGTGGTGTAATCGGTGATGCAATTTTAAATTTATCG
CCACGATAAAACTTAATAAATTGATCCTGATCTATCGCATTAACTACTGCTTGTCTCAAG
TTTGGATGCGTCTTAAATATACCTTTTTTAATATTTAGCATTAAAAAGACTGACTTGCGT
CCATTTTTGCGAATAATGCTTAAATTTTTATCCGACTTAATTAAATCAAAATGTTTTTGA
TTCACATCTGCCAACATATCAATTGAATGATTTCTAAGTTCTGACAATGCATTATTCGGG
TCACCATTAAACTTCAATGTAATATTTTTAATTTTAGCTGGTCCATAACTACCTTTTTCT
GTTTCGTTGAATCCTGGATTACGTTGAAACGTTGCTTGATATGCATTTTTCTGTGTCATA
ATGTATGCGCCACTTGCATACAGCGCATTTTTCCCATCTGAATTTGCAGGAATTGTACTG
CTATCCCCATATCCTTTTGGATATTCTTGATTTACTTGATTAACAAATTTTTTAGATAAA
ATGCCTGCCGAAGAGTGTGTTAAGTAATTTACCTCTCGAGGCATCGATTGATCTGTCGTA
ATTTTAACAATTTGATAAATACCGTCTTTATTATTTACTTTTTGACCATCTGTCGTTAAC
GATTTGACGTTATAAGCTTTAATCAACTTATCATAGATTGATTTATCGTCCTTGTCTTTC
TCTTTACGCAACTGATCGATGTCCTCATCTTTTAATATCTTGATGTCATTTATATGTTTG
TGCATATTGTAAGTATTATTGTTAGGCACAGACTTTTTATCACGTGCTCTATCTAAAGAA
AACTTAACATCTTCAGCCGATACACGCTCTCCAGTATTACGTGCTTGTCCATTGACCACT
TTCGCAAAATAATCATCATCTCTTAACAAGAAATAAAATGCTTTATTGTCCTTATTCACA
GCATAATCATGACTTAACGAACCTTTCGTTGTTAAATGATCATTTTCATCTAATAATAAT
AACCTTGTGTACATATTCATATTAATTGAATATACTGACGGCGCAATTGAACGTATTGGA
TCCAATGTAGGAATTTCACCATCTTGTTGTGTCATCACAAGTGGCCGCGTATCTCGTTCT
CTACTATTGTTGTAATCAAATTGTTGCCATATTAATGCACGTGAATTTGGCAATCCAACA
CTATTTTTATCTAACACTTTATTGTCATATACTAAATTCTTTTTTGATCCATATAAAGGC
GCCATATACCCTTTATCAAATACAACTTCATCTTCAATTTGCTTATATGTTTGTTTAACA
TCTGCTTCATTTTGAGTAGAAGCTTTATTTAACAACTGGTCTACATGTTTATCTTTCAAT
AAACTATTTGATCCTGTAGAACTAAATAATGCCGTCATAGCATAGTTCGGGTCACCAAAC
ACTGTCATCCAGTCATCAATTTGGATATCATAATTGCCGGCTTGACGTTGTGTACGATAG
CTACCATAATCTGGTTGGATATTCATCTTCACGTTAAATCCTGCATTTTCCAATTGATCT
TTAACGATATTCATATCATTTTCATAACTTGCTTGTCCTAGGAAATGTATTGTTGGTCGC
TCGCCTTTCACTTCAACTTTCGATGACTTTTGAGCCACTTCTGATTTCGTAGGGACACCA
CAACCACTTAATACCAACGCTAAAACTATAATTGCGATACTAATGATTTTCTTCACATCT
ATCCCTACCTTTTTAATGAATTCTTGGATCTAGTGCATCACGCACTGCATCACCTATAAA
ATTAAATGCTAAAACGACGAACATAATACAAACACCAGGTACAATAGCTAAATTACTGTG
CGTTTCCAAGTAGTTACTACCGGTACGTAAAATGTTGCCCCATTCAGCTACATCAGGTGC
AACACCAAGTCCTAGGAAACTTAAACTACTTGTTGTTAATACAACCACACCTATATTTAA
TGAAAAACGTACAATCATAGGCGCAATCGCATTCGGTAAAATATAACGCCATATGATATT
CCAAGTGTTTTCACCAGTGATACGTGCTGCATCTACATATTCCATGCGTTTAATTTCTAA
AACACTGGCACGCATTGTCCGTGCAAATGATGGTATATTACCGATACTTAAAGCAATAAT
TAAATTTGGAATACTTGCTCCAAATGATGCAATAATTGCCACCGCTAACAATAATGATGG
AATTGCAAACACTACATCTAAAATTCGCATTATTAAATTATCAATATGATTAAAATAACC
TGCGATAGTGCCTAGTAACACACCAAAAATAACTGCAATAACTACTGAAATAATTGAAAT
TGAAAATGTCAGCTTCGTTCCTACAACTACGCGTGTAAATAAGTCTCTACCGAAATCATC
AGTACCAAACGGATAGGCTAGACTCGGTCCATGTAACAGTGCATTGAACTGATTTTTAGT
AGCCAATGTCGTATCAAATGTAAATTGTGACACAATTGATAATGTCAGCATGTAGACTAA
AATAAGTAACCCGATAATCGCAATACGATGTCTAGTAGTTTTTCGTATAAACGATTCCCA
CCCGTTATAACTATGTATTTGCGATGTACGTTGGTAACGTCTAATACTTACAAACATTAA
TAATGTAAATACGTTGCCTGTTAATGTCATCAACAATAACAACACTTCGACGATACGTCG
CCATAGGTCATGATGCTTCCATGTTTGTTCCGTTGTTAAAATAATAATTAAAATGATGGT
TAAAACGATTAGCAATGTTTCAGCAATATAGAACGTATCGGCCACATAACCTTTAAAAAG
ATTTAATGCACTCGTTAATATAACTAAAATATAAGTTGCTATGGCGTAACTTGCGAATAA
TTTTAAGGAAGCTATCTTTGAATTAAGTTGTGCCATATGCCTCACTTCCTTTCGTTGATT
TCACTACGTAATTTTGGATCGATTAAAGCATAAAATATATCAATAATTAAGTTTGCTAAA
GATATTACAATTGATATATATACGACCCCACCCATGACTGCTGGAATATCAGGTATTAGT

TGTTTTTGGACGATATAACGCCCGATACCATTAATGTTAAATACTTGTTCCGTCACTGCT
GAACCGCCTAGTAACTCTGCCACTAGAAGACCAACTAACGTTACAATTGGAATAATGGCA
TTTTTCAAAATATGTTTAATAACAACTTGTGTCGTCGATAATCCTTTTGCATAAGCAGTT
AAAACATAATCGCTGCGCATTACTTCAAGTACAGAAGACCTTGTCATACGCGTGATAGAA
GCAGCAATACTTGTTCCAATGACAAGTACAGGTAAAATCAACGATATTGGATGTTCTGGC
ATATAAGATGGTGGCAAAATATCCAATTTCAATGAGAACGCTAAAATGAATAATAGCCCT
TGCCAGAAACTTGGAATAGATAAACCAATTAATGCAATTATCATTAACGTGATATCAAGC
CAACTATTTCGCTTCATCGCACTGATAATACCAATTGGTATTGCAATAATTAATGCCACC
ATTAGCGCTAATACTGCGACAATTATTGTAATTGGAATTCTTTCGCCAACTGCTTTAGTC
ACAACCTCATTCCCTTTGTAAGTCGTACCTAAGTCAAAGGTAAAAACACCCTTGATGGTA
TCCCACAATTGAATAAAATAAGGTTCGTTAAGATGATGTAATACATTGAATTGATGTATC
TGTGCCTTTGTTGCATTTTGTCCCAGTATGCTATAAGCCGCATCAAGCGGTGAAAAATAC
AGAATGGTAAACACACTGACAATAACACCAATGATGACAATCACAGCCATGACAATTCGT
TCAAAAATATATCTAACTAATGGCTGTAAATAAAAAGTCAATAAGATGAACATCGGCAAG
GCCAATATCA
LOCUS 89
ACGGATTGCTGTATTGAGTTGGTTATCATTATGTATATGTATCGCTTTAGCGCTCATATT
ATATGCATTACCATATCTCATTCTCGGTAGCAATAATTGGTCTTTTGTACTGACTTGGCT
ACCAATAGAAATTAAATTAGCACTAATCACAACATTAATTGCATTATTCAGTACATTAAT
TGTAATTCTGTTATTCCTTCATACAAAGATAACGAAGACATAATAAAAAAGACTTGTTCG
AGCCGTGCGTTTGATAATATATCATCCACGATTCGACCAAGTCTTTATTCTTTGTATATT
AAACGGATAAATTATTATTTAATTGGATTCATGCCATCTTTCCAAGTTTGATAAATCAGA
GTACCACCTTGCGCTTTAAACTTCTCATTGCTTACGCCACGTTCAAATGGTTGCGCAGGT
TGAATATCAATATTTGGTTCAACACCAAGTTGTTCTTTATACCATTCTGCAAATTCAGAA
CCTTTAACAGGTGCATCATCTGCTACATTATAGATACCATTTTCAAAATGAATAGCTTGA
ATAGATGTTTCAACTGCATCATCAAGATGCACAAATGATGTTACGCCATCTGAAAGTGTC
ACTTGACCATCCATAAATTGATTATAAATCATGCCATCTTTTCCGTACCAAGTACCTGGG
CCATATAACCAGCCAAAACGTAAAACAACGTATTCATCCATACGAGCCGTTTCTTCTTCT
AAACCAACCACACCATCAACCGTTACTTTTCTATCGCCAGTTGAGTTAAAATCAAGTGAA
GTTTCCTCATTTGCTAATCCTTCGCCAGGTTCATACATAAAGGCAATACTTTGGGCAATT
ACTTTCTTAACGTCATGCTTTTTCGCCGCATCAATTAGGTTTTTAGAACCTTCAATACGT
ACTTTCGTATTTGCTGCCATATCAACATTTTTTAAATCCGTAATTTGATTGATAATGATT
TCTGGTTTAAAATCTGCTAACGCTTGATCAATAGTATCAGCTTTTAATATATCACCAATA
TATGCTTTTACATTAACAGCAGCTAGCTTTTGTTGACCATTCTCAGATGTAGTAAAACCA
GCAACCTCATGCCCCTCTTCTTTTAGTCTTTGAACTAATTTAATGCCAATAAGGCCCGTT
GCACCAGTTACAAAAATTTTACTCATTATAAACACCTTTTCTCTATTTGTCTTTTTAATA
TAATTACTTGCTTGATGAGTTTACAAAATTCACGTGAGACTTCCAAATGATTTGCCTCAA
AATTTTTCAAAGTGTCGTCGTAAAAACTGTCTAGTAAATACTAATAGTATGTCGTAGACC
TATGACAAATCTGAATTATGACGAAGATCAATCAAGAAAAACAGCACCAAGATCATTTCA
ATTTGAAAGTACCTTACTGCTGTTCTTTATTTATTACATTTCAATCTTAA
LOCUS 92 F102
CCTGTGTAAGCGTGAATTGTAGTCATTAAACCTTCAACTAAACCAAAGTCATCGTTTAAA
ACTTTAGCAACTGGTGCTAATGAGTTTGTAGTACATGAAGCACCTGAAACAACTGTTTCA
GAACCGTCTAACTCTTGGTGGTTAGTGTTGAATACGATTGTTTTTAAGTCACCAGTAGCT
GGTGCTGAGATTAATACTTTTTTAGCGCCTGCTTCAATATGAGCTTGTGCTTTATCTTTA
TCAGTGTAGAAACCAGTACATTCTAATACTACATCGATATTTAAGTCTTTCCAAGGTAAT
TTGCTTGCATCTGGTTCACTGAATGATTTAACTTCTTTACCATTTACGCGGAAACCACCA
TCAACTACCTCTACTTCACCTGTGAAACGACCTTGCATAGTGTCATATTTTAATAAATGC
GCTAACATGTCGTCATCTGTTAAGTCGTTTACTGCTACAACTTCAAGACCTTCTACTTCT

TGAATTCTTCTGAATGCTAAACGACCAATTCTACCAAAACCATTAATTGCTACTTTTACT
GCCATTATAATGGCCTCCTTTAAAATGATATTTAAAAAGTATTAAACTTTTTATCTCTTA
TTCAAGTATTATCTTTGCTGCGGCTTCATCAGTGATTAACACTGTATTCTTGGGTGCAAT
CGTCAAGTATGCTTTAATTGCTTCACCTTTCGATTTGCCTCCTGCAACTGCAAAAATAAA
GTCTTTTGATTCAAGGTCTTCTAATTGAAGTCCAATTGTTTTAACCTTATGGACAATTTG
ACCTTGTGTATCAAAATAATAACCAAATGCCTCTCCGACAGCTTGATGATGTTGAAGTTG
TTCAATGACCTTTTCAGGTGATTGACGTCGATGCGCCATCTTCAGCGCATCACCAATGCC
GTGTAATATAACGTTTGCTTGTTTAATTTTGTCTAAAGTGTTTATGACTGATGGCTCTAA
CAACAATGTATTATATGTTGTTTCACTGACATTATCAGGTACATACATCGTCGTATAATA
ACCGCCAGCTTGTTGTGCCATACTGGCTGCAATTGTGTTTGCCTGAAAGACAACATTTTC
GCCTAGTCCACCTCTGGCTGGTACGAAGAATACATTATATGGTAATAAATGAATTGCTTC
ACTAACACATGCCATCGTGGATCC
LOCUS 93 H128
GGCTATCTATCAAAATAAAGATGGTCATTTAAAGCGTACACTTCGGGTGCGTGATTTCTT
AGCTTTAGGTGTAGGAACAATTGTATCGACATCTATCTTTACGCTACCTGGCATTGTTGC
TGCAGAACATGCAGGACCGGCCGTTGCGTTATCATTCTTACTCGCTGCTATTGTTGCTGG
TTTAGTTGCATTTACTTATGCAGAAATGGCTGCCGCTATGCCATTTGCAGGTTCAGCCTA
TTCTTGGGTCAATGTATTATTTGGTGAATTTTTTGGATGGGTTGCCGGTTGGGCTCTATT
AGCTGAATATTTTATCGCCGTAGCCTTTGTTGCATCAGGATTCTCAGCGAATTTACGCGG
ACTTGTGAAACCAATTGGCATCGAATTACCTGCAGCATTATCAAATCCATTTGGTACAAA
TGGCGGTTTTATCGATATTATTGCTGCTATCGTTATTTTATTAACTGCATTATTACTATC
ACGTGGTATGTCGGAAGCAGCTCGTATGGAAAATATTTTAGTTATTTTAAAAGTATTAGC
TATTATTTTATTTGTCATCGTAGGTTTAACAGCAATAAATGTTAGTAACTATGTGCCATT
TATTCCAGAACACAAAGTAACTGCTACAGGTGACTTTGGTGGATGGCAAGGCATATATGC
TGGTGTTTCAATGATTTTCTTAGCGTATATCGGTTTCGATTCTATCGCAGCAAACTCAGC
AGAAGCACTTGATCCTCAAAAGACAATGCCTAGAGGTATTCTTGGTTCTTTAAGCGTTGC
TATCGTATTATTTATTGCTGTAGCACTTGTGTTAGTTGGTATGTTCCATTACTCACAATA
CGCAAACAATGCTGAACCTGTTGGTTGGGCTTTACGTCAAAGTGGTCATGGTGTTGTAGC
AGCTATTGTTCAAGCTATCTCTGTTATCGGTATGTTTACAGCATTAATTGGTATGATGTT
AGCAGGCTCACGTTTACTTTATTCATTTGGACGTGACGGCT
LOCUS 94 HA2
GATCAAAATTAGGCTTGTTTGCTAATTTTACCGCATTACCATGTTCGCTTTCGCGGTTCG
CAAAACCATCTAAAATAATTAACGCAGTTGGTTTCTTAGCCATGATTATTTTGCACCTTC
TAACAATTGTACGAAATCTTCAACTTTAAGTGATGCGCCACCTACTAATGCCCCATCAAT
ATCAGTTTGTGCCATGTATTCTTTAATGTTGTTAGGTTTAACACTACCACCATATTGAAT
ACGAGTTGCTTCTGATACTTCTTTGCTTGATAAGTCAGCAATAGTTTGACGTACAAATGC
ACACATTTCATTTGCATCTTCAGATGTTGATGATTTACCAGTTCCGATTGCCCAGATTGG
TTCATAAGCAATTACAACTGATTTAAGTTGATC
LOCUS 95 HA5
GATCTTAAACTTTATCTTTAGCTTTTTAGCTTCAATGTTCTTCTGCGTCATTTTTGATGC
ACCTAGAAAATTATATCTATCATGTGGTTTCGTTGGTACGTGTGGATGGATGGTTTACAC
CTTATTCTTCAACGGCTTTAATGTGCACACTATATACTCTAGTTTCTTTGGTAGTTTAGC
ATTAGGCTTGTTAAGTCATTATATGGCTCGTAAACAAAAAGAACCTGCCATCATTTTTAT
GGTAACGGGTATCATTCCATTAGTACCTGGTGGCTTAGCATACGATGCTACAAAAAATTT
AGTCTTATTAAATTTCAGTACAGCAATCAATACCATGCTAGAGGTTACACTTATTGCAGG
CGCCATCGCATTAGGTTTATTATTCGCCGACCAAATTTCCAAATTAATTGTTTCTGGGTT
CGTGAAATCTTTTAAACGATTATAAATATTTGTTAGAAATGGCTCAGCCCTAACTCTTAG
CAATTATATATAAGGTTCAGCTGCCTCGTCTTAAATGTCAATTTATAATACAAAAAATCG

CACGATACGCCTCCGAATGAAGAAGGTTTATTGTGCGATTCTTTTATTATTTAGTTTTTT
CTTTTTCAGGTTCTTCAATCATATCATCAACTTCATTTTCACTTCTATTTAAAATCAAGC
GACTTAATTCATCATTATCCATATTTTTCAATTTAGGATATCGAATCACAAAGAATATTA
AACCGATGATTAACCATCCAAGTAATGCAATATAAGACGGTGCAGTCAGTGCTGCAGGAG
AACCTGGCACTAATAACAACGCTAAGAAAATGAATGATACAAATGAGCCGATAATAGCAA
ACGTTTTGTAAACCGGTGCATACGTATTACTTTGTTTGTTATAACTGAATAATTTCGCTG
CAGACAAACATGTAATAAAGTAGGCAATGGATACACCAGTAGATGACATATCTACAATCC
AAGTCAATGCAGTTCTTCCTAGCCAAGGTGCAATTAACGACACTCCTACTAGGAATATGA
TTGCGACATATGGTGTTTTGTATTTACTATGTAATTTACTAAACATTGTTGGCATAATAC
CTGAACGTCCCATAGAAAATAACAAGCGACTTGAACTCATCAAGAATCCATTTAAACCAG
TAAATATACCCATCATAATTGCAATTGCTAATACACCTAATCCAATATAACCAAATGCTG
TTTGTGTAACAGCACCTGTTAACCACAACTGCCCATTTAAACTTTGATGACTTGTTGATA
ACCAACCAGTGTATAAAATCATGACAACATAAGTTAATGATGCTGCTAATAAACTGTACA
CGATAAGCTTAAATGTCTTGTTTGGTGCAAAGTTAAACTCTTCTGCTGTTTGTGGAATAT
TATCAAATCCAACATATGCCCATGGTGCCACGGATACAATAACCACAATAGACACTAACC
ATCCTTTGCTAGGTTCAGCTAACGGTTGTAAATTTTCAAGTGCAAAATTATTACCAAAGA
ATGAACCAAAGAACATCAATAATACGACGATTACCATCGCCACACAGAAATAATATTGTA
ATGATCCAGATACACTTGCGCCACGAATCGTTACTAGCATGAATACAAGTAGTAATACGG
TCGCAATAATGATTTCCGTAATATAAACGTCCCAGCCCGCAATGGTGTATAGTTTCCCAT
TATTTAAGACATCTGGCAATAAGAATTTAACTAGTAAACTGAATGCGGTCGCATTTAAAG
CAACGACACAGACATAACCAAAAGTTAAAAACCATGATGAGAAGAAACTCACATATCTGC
CGAAACTTAAGAAACTAAAGGCAAACGCGCCCCCTGATACTGGAAATCTCTCTACTAATG
CGCCATAACTAACCGCAATTAATATCATTAATAATGCACCAATAACTATACCAATTGATG
CTGCAATCGGACCTGACTGCTTAATCCAGTCTCCTGGTAAGATGAATGCGCCCCATCCGA
TACATGAACCATATGCAATCGCCCATACAAACTTTTCAGATAGGTTTTGTTTTAAATCGC
CTCTATCTATTTGCTTATTCTTTTTTTCCATAAATAAAAACTCACCTCGAAGGTATTCTA
TACCCAAAAGATGAGTTTGTAACTCTTTTTCTTGATTATTTTTATTAAAAATTTAATGTT
TAGTTACATAGGTAATCTAAAGTTTTAAAATTTAACCAGCAAATTTGAATGTCGCAATGA
TTAACATTATCCATCCAATGATGAACAATACGCCACCAATTGGCGTAATCGCACCTAAAA
CTTTAATTTGAGTTAATACTAAAATATATAATGATCCACTAAAGAAAATAATACCAGCAA
ATATTAACCAGCCAGCCCAGTTAACATTGATTGAAGTTGTACCACTAATTACACCTATAA
TTAATAATGCTAAGCCATGGTACATTTGATACGTCGTTGCTTTTTCCCATACTGATAAAT
AGTGATC
LOCUS 96
GATCCAACATTACGACGCGTGATGAACGAAATAGATAAAAAGCCAGAGTTAAGAGAGCGA
TTTATTACATCAGATGATGCTTGGGATATGATGACATCTAAGACAACCGTAGTGATTGTT
GATACGCATAAACCGGAACTGGTTTTAGATGAAAATGTCTTAAATAAAGCAAACCGTAAA
GTTGTTATCGATC
LOCUS 97 (HA12)
GATCGGAATTCCGTTTGCTGCGGGCTTGATTAATTTTGTAGTATTAACCGCTGCTGCTTC
ATCATGTAACAGTGGTATATTCTCAAATAGCCGTATGCTTTTCGGTTTATCAAGTCAACA
ACAAGCACCTCCGAACTTTTCTAAGACGAATAAATATGGCGTTCCACATGTTGCAATCTT
TGCTTCATCAGCATTATTACTTGTGGCAGCATTACTAAACTATATTTTCCCAGATGCGAC
AAAAGTATTTACGTATGTGACTACCATCTCTACAGTGTTATTTTTAGTTGTATGGGGTCT
GATTATCATTGCATATATCAATTATAGTCGTAAAAACCCAGATCTACATAAAAATGCTAC
GTACAAACTATTAGGTGGCAAATATATGGGCTACTTAATATTTGTATTCTTCATTTTTGT
GTTCGGGTTATTATTTATTAATGTTGATACAAGACGTGCAATTTATTTTATTCCGATTTG
GTTTATACTTTTAGCATTTATGTACTTAAGATATAAACGTATCGCTGCTAAATCAAATAA

ATAACAACAAGTTTTAGGGCTTGGGACATTAAGTTCTTAGGCAATGTAAAAAAGCTGATT
TCTATTAATTATTTGATAGAAATCAGCTTTTTTGATATGTATTTTATAATGTACAGCTCG
TTGAGCTGCTATTTTCCTTATATTAAGTGCCATCAATACAAAACCTAGCTCTCGTTTAAC
TTTATTTATTCCTCGAACTGACATTCGAGTGAAACCCAAAATAGCCTTCATAAATCCAAA
AGCAGGCTCTACATCAATTTTTCTTTGACTATAGATGTTTTTCGTTTCTGGTTCAGAAAG
CTTTTGATTAATTTGGACTTTAAAGTATTCCCAATTATAATTCTTCATGATTTTCTTATT
GGATTTCGAATTTGGTTTCATGCATTGATGTCTCAAAGAACATGATGAACAGTCATCACA
TTCATATAGTTTGAAGTCTCGTTTAAAACCATATCTATCATTACGGTATGCATATCTTTT
AAAACCTATTCTTTTGTTATTAGGACATATAAATTCATTATTAAGTTCGTCATATTTCCA
ATTTTGAGTGTTGAAAATGCCACTTTTAAACTTTCTAGTTTTATCTTTAATAAACATGCC
ATACGTAATAAGTGGCGTTTTATTAAAATCATCTATAATAGCCATATAGTTTTGCTCACT
ACCATAACCTGCATCAGCTACAATATACTCTGGTAAATAACCGAAGGTATTTTGAATCAT
TGTTAAAAATGGGATTAATGTTCTAGTATCTGTTGGGTTTTGAAATAGGTCATAGGATAA
AACAAATTGAGAATTTGTCGCTATTTGTAAATTGTATCCTGGCTTAAGTTGGCCATTTTT
CATATGGTCTTCCTTCATTCTCATAAAAGTTGCATCATGATCAGATCAGTTTTAGAAAAA
CTATTTCTATCTTTAAGAATCGATTTTTGTTCTTCATATTTATTTTTTCTTTCGGAATAA
TCATCAAATTTCTTTTTGAACTTCTTAATCTCAGTTATTTTTTTACGGGTCTGTTTTCTA
ATTTGAGCACAATCTTCGTTCTCAATAGAATGATTTAAATCTTCGATTTCTTTATCTAAA
TGACTACCAATTAAATCTATTTCTTCTATTGTTAAATCGCTATCTCCATCTTCTTTTATC
TCTGGTATTATTTTTTCTTCAACTAAGTCACGATATAATGTTTTTGAATTTTCGTTCAAT
TTCGATTCGTGATTTTGAATACTTTTCTTCCACACAAATGTATATCTATTGGCATTAGCT
TCTACTTTTGTACCATCAATAAAAATTGAATTATTATCAATAAGATTTTGCTTTAAACAT
TGACTATGGAACTGAATAAATAAAGATTCAATTAACGCATCAGTATTAGGATTCACTCTA
AAACGATTAATAGTTTTATAAGAAGGTGTTTGATCTTGAGCTAACCACATCATTCGAATA
CTGTCATGAAGTAATTTTTCTATTCTACGACCAGAAAATACAGATTGAGTATATGCATAT
AAGATGATTTTTAACATCATTTTTGGATGATAGGATGTTGCGCCACGATGATGTCTGAAT
TCATCGAATTCGCTATCAGGTATCGTTTCAACAATTTCATTAACATATCGCGAAATATCA
TTTTGAGGAATTCTAACAGAGGTTTCTATTGGTAGTGTAAGTTGGGTCATGTTATAAATT
TTATACATAAGGCACCTCGTTAATTTAGTTTAGTGGTATTTATTAAATTATACGAAGGGA
CCCAACACAGAAAATTCATTTTATTGAATTTTACATTTATGTGCAAGTTGGGCAAAGTGT
TTTATTTTTTTAAAGTATGTAAAAGTAAAATTACATGTTAATACGTAGTATTAATGGCGA
GACTCCTGAGGGAGCAGTGCCAGTCGAAGACCGAGGCTGAGACGGCACCCTAGGAAAGCG
AAGCCATTCAATACGAAGTATTGTATAAATAGAGAACAGCAGTAAGATATTTTCTAATTG
AAAATTATCTTACTGCTGTTTTTTTAGGGATTTATGTCCCATCCTGTTTTATATGCAACT
TATAATATTAAATTGCGTACTTGGCTCAAAACTTTTACTTTCTCATCTATTTAATAATGT
ATCATTTCAGAAATACATCCATACTTCTATTTTATAATAAATTTCCAAAGTAATATGAGT
GAAAGTTTGAAGGTGATAATGTACATGTATAAAAGATATAAACATTTATATAGATTGCCA
TTCATACACTATCATTATCAAATAACCTATTAATTACGTCATAAAATACCAGATGAACCA
AAAAACGCCTTTCCATTGTTGATAAATGGAAAGACGTTTTTTTATAAATTATAGTACGTT
TGCATATCCTTCAAAGATTTTACCTTGAGCAGCATCAATCGTAACTAACATGTTATTGCT
TATGTTTTTAACAGCTTTTTCTACACCTACAACTGTTGGAATACCTTTTTCTAAACCAAC
AATTGCACTTGGTGATGTAATACCATTTTCTTCTGTAATTAAGCCTAAAGCTTTTTCTAC
ATAAGGTACAAACGTTTCATCGATTGAGTTAGTAACGATAACTTTGTCAGATAAATCTTT
ACCTTCTAAATCTTTAACAGTTTCAGCAACTAACGTAGTACCAACAACTGATC
LOCUS 98 GE2
GATCCACATTGGGCATAATCACAGCTAATTTGTGTTCATTCGCATACCTTTCTATGCTTG
TATATCTCATATATGTCGTTTCATCACTTGATAATCCATGTAACAACATTAAAGTTTTTA
ATGGTTTAACAGTTGTATCGCTATTAAAGAAGCTTTGATCTTCCGGTAAAATGACTGTCA
AATTTTGATGCATACCAATTGTTGGTGAATGATAGTTTAATGAAATATAAGCCATACGTC
ATGACCCCTTTCTAATTCTACTTTATCAACATTTTACGCTTAATCAATTCACTTTAAAAT
CATTTTCAACAAAAAAACCGAATACAAATGTATTCGGCCTAAAAAAGTATTTACGCTTTT

TCTTTATGATCTTGCTTGCGTTTTCTAAACAATAGTAATGATCCTAATAATGCCATCATT
GCACCAAATAAAGTTGCATTTGTGTTTTCGCTCTTATCTCCTGTTTCTGGTAAAGCATCA
GTTTTGTGTTGTTTTGATACCTTATTAGAATGGTTTACTTCACCTTTAGGATTTGATGGT
GCTTTCTGTTCATTATTTGGTGGTGTAACTCTTGAATCGGAGTCACTATCTGAGTCTGAG
TCGCTATCTGAATCCGAGTCGCTATCCGAGTCTGAGTCGCTATCTGAGTCTGAATCGCTG
TCTGAGTCTGAGTCGCTATCCGAGTCTGAGTCGCTGTCTGAATCTGAATCACTGTCTGAA
TCCGAATCGCTATCTGAATCTGAATCGCTATCCGAGTCTGAGTCGCTGTCTGAATCTGAA
TCGCTGTCTGAGTCCGAATCGCTATCTGAATCTGAGTCGCTGTCTGAGTCTGAATCGCTA
TCTGAATCTGAGTCGCTATCTGAGTCTGAGTCGCTGTCTGAGTCTGAGTCGCTGTCTGAG
TCTGAATCGCTATCTGAATCTGAGTCGCTGTCTGAGTCTGAGTCGCTATCTGAGTCTGAG
TCGCTGTCTGAATCTGAGTCGCTGTCTGAATCTGAATCGCTGTCTGAGTCTGAATCGCTA
TCTGAGTCTGAATCGCTATCTGAGTCTGAATCACTGTCTGAGTCCGAGTCACTGTCTGAA
TCTGACTCACTATCTGATTCTGAGTCGCTATCTGATTCTGAGTCGCTGTCTGAATCTGAA
TCACTGTCTGAATCCGAATCGCTATCTGATTCTGAGTCGCTATCTGAACCTGAGTCGCTG
TCTGAGCCTGAGTCACTGTCTGAATCCGAATCCGGATCCGGGTCTGGGCTTGGTTCCGGT
TCTGGGTCTGGACTTGGTTCTGGATCTGGCGTTGGTTCTGGTTCTGGGTCTGGACTTGGT
TCTGGGTCAACCGGCGGCCCTGGAGTTGGGTCTTTCGGATTTACTGCTGAATCACCATCA
GCACTTCCACCACCATAACGTACAACATTCTCATTATTCCAACCGAAAATACTGTAGTCT
CTATTTGTTACAGGATCAACATTTTCTTGAATAACCTGAGTTTTTAAGTTCTTACCTGTA
TTGTCGTAATGCCCTTCTACTAATACTACATATGTTTTAGTAATATCACCAAATTTAATA
CTAGCTACATTTGGATGCTCATAATAGATTCTATTTTTAAATTGGTCTGTTACTTCTTTA
AGGTTAGAGTCATTTGGATCTGCATAGTAGCTATCTGATAATTTAGATGTATCATTCACT
TCAAAAATTCTCAGTTTTGTATCTGTAGCACTTACTTTACCGCTACTTTCTTCGATTTTA
TCTTGGTAGCCTTTAATATACACCCACGTATTACCTAAAACTCGTTGCTTAGGGTTAACA
AATACTGTTTGCTTGTATGTGTTTTGACCTGAAGCTGTATCTACACCAATAATTTGAGAA
GAAATGTTCGCGCCATTTGGTTTATCAATTCCTGCAATTGGCGAACTATAGTTATAAGTA
ATTTTATTATTAAACATTTCATCCGCAATATTAATATTCGCATCATATGTTCCTGATTTA
GGTGCCTTTGCTCGGTCTGTAAATAAAGGTAATGAAAATTGTCCGTTAATATTTTCTTTA
TTATTTACATAATCTGTAAAGACAAATGTATACGTCTTAGTCAAGATATCATATGTTGCT
TTAGCTACAACATCGCCATTCGTACTTTTAATGTCTGCAATTGGCATCGTATTATTTGAA
TTAGAATAATCCACGTCTCCATTACCAGTTAAACTATCTGGTAACTTCGCTGTAAAATAA
TCCCCTGATTTCACTTTATCTGTCACTGTAAAATTTGCCGCCATAAATGTGTTACCACTT
TGATTAGGGTCAAATGTAGTCTTTTCTAACTTGAAATTACTTGCCGTAACTTTATCATTT
ACATTTGTACCTTTAGCATCAGCAGCATTTACTACCGGTTCAGCAACAGCTAAACTACGT
ACAGCTCTCGTTCTAACACTTGGTTTACTAGTTCCTTGCGCATTGGAAATCGTTTGTGGT
GATGATTGTGGTAAATCTAATGTTTGAGAATTTTTAAGCTCACTGTTTGTTGCTATGCTA
TTAGCATCATTCGTTGTTTTATTATCTACTTGAGAATTTGCTTCTTGAGGAACAGTTTGA
TC
LOCUS 99 GE3
TTAATGATTTCTAACAATCTTAATGTTGCTACGACGTTTATTTCTTGAGATAAGATAGGT
TTCTCAACCGACTCAGCAACACTAACTAATGCTGCTAAATGAATAACATAATCAAATTGA
TATGTCTTCATGATTTGTTCAACTGCATCATATTCACGAATATCTAATTCAAACACATGA
TCGTCAGCCAAACTTTTAATATTTTCTCGTTTACCTGTTCTATAGTTATCTAGAACATAA
ACATCATAATCTTGTTGTAAATCATCTACTAAATGCGACCCAATAAAACCAGCCCCACCA
GTTATCAAAACTCTTTCCAAATCTTCCACCTCATTTATACATTAAAAATATATCATAAAA
ACATAAAGTATTGTAAGCTTTTTATCGATATTTTTTATTTATAAAAATAAAATGAGATAA
CTTTGTGAATTTTTATTGAGATAAATTAGATAGTGGTGTTTTTGTGATGTTTTATAATAT
CTTGGGTGTGTTAATACTAATAATGCTTTCAACTGATGCATTAGACTGTGACATCATAAC
TCACTTAAGAACTTCGCTTATTAATTTTCTACCAATACACTCCCTTCTAAGTGCACTAAA
AAATCCTTACTGCTAAGTGATTAAACTTAACAATAAGGATTTATTTATCATTAGTGGATG
ATTATTAACGGAATCTCATACCACCATCTACAATAATTGTTTGTCCAGTAATGTAATCAG
AGTCTTTACCAGCTAAGAAGCTCACTACATTTGAAACATCTTCTGGTTGAGAAACTCTGC

CCAAAGCAATCTGACTTGTAAATTGTTCCCAACCCCATGCTTCAGGTTTACCTGCTTCTT
CGGCTGTTGCCACTGCGATACTTTCCATCATTGGTGTTTGAACGATACCAGGTGCGAATG
CATTCACAGTAATACCTTCAGACGCTAAATCTTGTGCGGCTACTTGTGTTAAACCTCGCA
CTGCGAATTTTGTACTGCAATATAAAGACAAGCCTGGGTTACCCTCAACGCCTGCTTGAG
ATGTTGCATTGATAATTTTACCGCCATGATTGAATTTTTTAAATTGTTCATGTGCGGCTT
GAATACCCCATAGCACACCTGCAACGTTCACGCCATATACTGTTTTAAACTGTTCTTCAG
TAATTGTATCGATTGGTGTTGTTGGTCCAAGGCCGGCATTGTTAACCATGACATGGAAAT
CGCCAAATTGCGCGGCAGTTTGTCTTACTGCGTTAAATACATCATCACGGTTTGATACAT
CTGCTTTGATAGCAATAGCTTTTGTACCATCACTTGATAATTTAAGTGCAGCTGCTTTTG
CCCCTTCTTCATTGAAATCAACAACTGCTACTTTGAAACCATCTTCCACTAAACGTTCTG
CAATTTTAAAACCAATCCCTTGTGCTCCGCCAGTTACTAATGCTACTTTGTTGTTTGTCA
TAAAGATC
LOCUS 100 GF5
GATCTACTTCTACAACTTTAGGCATGTCTGCTAAGTGAACACTTTCTTCTTTAACATGTG
GTGTATGAGACCAAACTTCTTCAGCTGTATGCACTAAGATTGGTGCTAACAACTTCGTCA
TATCAACTAAAATTTGATATAACACTGTTTGCATACTACGACGGATATGAGAATCACGTT
GTTCAATATATAAAATATCTTTACCGTAATCCAAATAGAAATTACTTAACTCAACATTGA
TAAAGTTTTGAACTTCTTGATAAATATTTAAGTAGTCAAAGTTTTCATAGTTGTTAATCG
TACTTGCAGTAAATTCACGTAAACGATTTAGCAAGTAACGATCCACTTCTAATAACTCTG
ATTCAGGAATGCTATCTGTGTCAGGATTGAAATCGTTAATGTTACCTAACATAAATCTTA
ATGTATTTCTGATTTTACGATAAACATCAGATGTTTGTTTTAAAATTTCATCAGAAATTC
TAACATCAGCTAAATAGTCCGTACTACTTACCCAAAGTCTCGCAATATCAGCACCTTTTT
GTTTAACCACTTGGTCAGGTACAATCACATTACCTAAAGATTTACTCATTTTCTTACCTT
CACCGTCCATAACAAAACCATGAGAAAGTAAGAATTTATAAGGTGATACTCCTCTTGTAG
CAACTGAAGTTGTGATAGAAGAGTTGAACCAACCACGATATTGGTCACTACCTTCTAAAT
ACATATCCGCTGGGAAACTTAATTCCGGTCTTGTTTCCAACACGCCACGGTGTGATGAAC
CAGAATCAAACCAAACGTCCATAATGTCTGTTTCTTTAGTAAATGTACCGTTAGGGCTGC
CTGGATGTGTAAATCCTTCTGGTAGTAAGTCTTTCGCTTCTCTTTCAAACCAAATATTTG
AACCGTGTTCTGCAAATAAATCAGCAACATGATTCACTGTTTCTTTCGTCATGATAATTT
CGCCATTTTCAGCATAAAATACTGGTAACGGTACACCCCACACACGTTGACGAGAAATAA
CCCATTCGCCACGGTCACGAACCATATTGTAAATACGTGTTTTACCCCAATTTACTTTGA
AGTTTGTATTTTCGATTGCATCTAAAATATCTTGTCTTACTTTACTGATTGAGGCAAACC
ATTGTGGTGTAGCACGGAAGATTACAGGTTTTTTTGTTCTCCAGTCGTGTGGATAGCTAT
GTGTAATAAAGTCTAATTTTAATAGTGCACCTTTTTTCTGTTAATAAATCAGTAACGGCTT
TATTAGCTTTATCATAGAACATCCCTTCAAATTGGCCGCCTTCTTCAGTAAATACACCTT
TATCATCGATTGGACTAATTACTGGCAATTCATATTTTTGACCAACAATATAGTCATCTT
CCCCGTGACCTGGTGCTGTATGTACACAACCTGTACCAGCATCTGTAGTAACATGATCAC
CATTAATCACTAACGATTCTCTGTCTAAGAATGGATGTTGTGCTACAACATACTCTAATT
CTTTACCTGTGTATTCTTTTTCTAATTTGATTGATGCTTTATCCCAATCCAGTGCTTCTG
CTACAGCGTCAGACAAGGCTTCTGCAATAATATATTTTTCGCCATTTACATTGTATTGAC
CATATTTTAATTCAGGATGAACGGTAATCGCAACATTTGATGGAATTGTCCATGGCGTTG
TTGTCCAGATAATAAATTTAGCATCTGCATCAACGACACCTTTGTCATCTTTAACGTCAA
ATGCAACGTAAATTGATGCTGAACGTTTATCGTGATATTCAATTTCTGCTTCTGCTAATG
AAGACTCACTTGAAGGAGACCAATAAACTGGCTTTTTACCTTTATAAATTAAACCTTTAT
CTGCCATTTCTCCAAAAATACGAATTTGTGCAGCTTCGTATTCAGGTTTTAATGTAATAT
ATGGATC
LOCUS 101 (GF7)
GATCAAGTTCAAGGTTCATTAGAAATTATTTATAGTTTGCAAGAAGAATTAAAAGAAATT
ACTGGTATGGATGAGGTGACATTACAACCAGCTGCTGGCGCACATGGTGAATGGACTGCA

TTGATGATATTTAAAGCTTACCATGAGAATAATGGTGAAGGTCATCGTGATGAAGTCATT
GTGCCAGATTCTGCGCATGGTACGAATCCAGCCTCAGCTTCATTTGCAGGATTTAAATCA
GTTACTGTAAAATCAAACGAACGTGGCGAAGTTGATATTGATGACTTGAAACGTGTTGTA
AATGAAAATACAGCAGCTATTATGTTAACTAATCCAAACACTTTAGGTATTTTCGAAAAA
AATATTATGGAAATCCGTGAAATCGTCCATAATGCTGGTGGTCTATTATATTATGATGGT
GCGAATTTAAACGCTATTATGGACAAAGTTCGCCCAGGAGATATGGGATTTGATGCTGTT
CATTTAAACTTGCATAAAACATTTACTGGTCCACATGGTGGTGGCGGTCCTGGTTCAGGT
CCAGTCGGTGTAGTAAAAGAACTAGCAAGTTACTTACCAAAGCCAATGGTTATTAAAGAT
GGCGACAAATTTAAATATGATAATGACATTAAAAATTCTATCGGACGTGTAAAACCATTT
TATGGTAACTTTGGTATTTACTTAAGAGCTTATACGTATATTCGAACTATGGGAGCAACT
GGACTTAAAGAGGTTTCTGAAGCAGCGGTTCTTAATGCGAATTATATTAAAGCACGTTTA
TCTAAACACTTTGAAATACCTTATAAACAATATTGTAAACACGAGTTTGTGTTAAGTGGT
GTGCGTCAAAAAGAATTTGGTGTACGTACTTTAGACATGGCTAAGCGATTATTAGATTTC
GGTGTACATCCACCAACAATATACTTCCCATTAAATGTTGAAGAAGGTATGATGATTGAA
CCGACTGAGACAGAGTCTAAAGAAACACTTGATTATTTTATCGATACATTAATTAGTATT
GCTGAAGAAGCTAAAAATGATCCTGATAAAGTGCTAGAAGCACCACATACAACTGTGATT
GATCGATTAGACGAAGCTACAGCTGCTCGTAAACCAATATTAAAGTTTGAAAATCTTAAA
CAGGAAAAATAAAGTATTAAACACATATTCCGAGAATTATTATTCTAACTTTGTATGAAG
ATTTAAGGATAATGGTTTCAAAATCAATTGAAAAAGACAATTTCTATTTAAACAAGAAAA
CTAAACCGAAGTAATAACTCTTAGGGTTTGGTATTATTCTTTCATAGAAATTGTCTTTTC
ATTTTTTAGATTGCGGTAATTGAATCGTATTGAAAATGAGCTGAACTTTCTTTATTATGC
TGAAACTAAGTTTAATGATC

LOCUS 102 (GF9)

GATCCTGTGTTAACTGGTCGTTAAAAGTGACTTTCGTTTCAGTGTAAAATTTTTCTAATG
TAACAGATATGCTATTATTCATTGGAATGATTAGTGCTTCATCTTTTTTACCCCAATATT
TTATAAGTGCAATATTCGTATGTGCACGTGCTTTGCCACTTTTAATCAACGCATTAACCT
CCTAAATTCTCAATCCAAGTATGTGCTGCACCAGCTTTTTCTACAGCTTTTACAATATTT
TTCGCTGTTGGTAAATCTTTGGCAAGCAATAACATACTTCCACCACGACCAGCGCCAGTA
AGTTTTCCAGCAATCGCACCATTTTCTTTACCAATTTTCATTAATTGTTCTATTTTATCA
TGACTAACTGTCAACGCCTTTAAATCCGCATGACATTCATTAAAAATATCCGCTAAGGCT
TCAAAGTTATGATGTTCAATCACATCACTCGCACGTAAAACTAACTTACCGATATGTTTT
ACATGTGACATGTACTGAGGGTCCTCACAAAGTTTATGAACATCTTCTACTGCTTGTCTT
GTTGAACCTTTCACACCAGTATCTATAACAACCATATAGCCGTCTAAACTTAACGTTTTC
AACGTTTCAGCATGACCTTTTTGGAACCAAACTGGTTTGCCTGATACAATCGTTTGCGTA
TCAATACCACTTGGTTTACCATGTGCAATTTGCTCTGCCCAATTAGCCTTTTCAATGAGT
TCTTCTTTCGTTAATGATTTCCCTAAAAAATCATAACTTGCACGAACAAAAGCAACCGCG
ACAGCTGCACTCGATCCTAATCCACGTGATGGTGGTAAATTCGTTTGGATCGTTACTGCT
AGCGGCTCTGTAATATTATTTAATTCTACAAAACGGTTCACCAAAGACTTAAGATGGTCA
GGCGCATCATATAACATACCATCGTAAACATCGCTTTTAATAGACGAATAGTTCCCGCTC
TCTAAGGCTTCTATTAAAACTTTGATTTTACCTGCGTTAAACGGTACTGCAATAGCAGGC
TCTCCAAATGTAACAGCATGTTCTCCTATTAAAATAATCTTACCTGTCGATTCCCCATAT
CCTTTTCTTGTCATGTCAATATCACCTTTTATATTTATCCTATACTTGATTCATTATTTT
TATTTATTAGTAAAAGACATCATATTCTAAGTTGCATACGCATTCGCGTTAAATTTCATT
GCAGTCTTTATCTCACATTATTCATATTATGTATAATCTTTATTTTGAATTTATATTTGA
CTTAACTTGATTAGTATAAAACTAACTTTCGTTTACTTCAAAGTTTAAATCTTATCGAGT
GATATTTCAGATTCTTTATCTTTTTATAAAATAGCCCTACAATTTATAATTTTCCACCCT
AACTATAATACTACAAATAATAATTGGAATATATAGATTTACTACTAAAGTATTAGAACA
TTTCAATAGAAGGTCGTTTCTTTCATAGTCATACGCATTATATATACCCTATTCTCAATC
TATTTAATACGTAAAACATGAAATTTTCTTATTAAATTTATTATTTCCATCATATCATTA
CTTTTAATTTAATGATGTTCAATTTAAATATTAGGTCAATAACATATTTATGCTTTTTAT
GGATACTTTCAAAAATAACAGCCCCAAACGATAACTTGAAAGGGGCTGTTAAATATTTAA
CTATTGCATT

LOCUS 103 (GF11)
GATCATTCATTTTAAAGCCAGACTTTTTATAATCTTGTACAAATGCTTGCGCTACATCCT
TGTGTTGATCAAGCAATTCCCCTCTCAGTACTAGCACACAGCAATACGCATCAGGTATAA
CGTCATCACCATGTTTCAAAGTCTTACCTTTGCCTAACTTTTCACCCAGTGCACCGAATG
GTTCGGCTACAGAATACCCTGTAATTCTGTGTTCACTCAATGCGGCTGGCATTTCTGCTG
GCGACATTTCATGATAGCTAAAATGCCCCGGTTTAATCTTTAATTGTTTACGTAATTCCT
CAAGTAAAAGATAATGTGTTGAATAACGATGTGGTATACCAAAATGGTAATCATCGCCAT
TATTATTAAATTCATTTAAGTGCATACCTTTTTGTCCCATAATGACATTGCCTTCATGAT
GGCCCAATGCCACAGCCTTTATATTTGAGCCCTTCTGTTTTGATTTCATCGCTAGCTCTA
TTAAAGTTGATGCACCATCAATACGACCACTGTTTAATGCGTCCATTAAATCTGGCCAAT
TATTGAATTTAACTAATTCTAGTTTATATTTCGGATGATTGTATTGTGATAATAATTTTT
TAGTCATCATCAAATTAGCTGAATGTGTAATCGGCAAATATCCAATTTTAATCACTTGCT
GATTTTGGGCATTTTTAGACCGTTCTTTAGACGTCCTTTGCCAATCACATCCTGTAATTA
TAAAGATTCCAATGATGACGATTATGCTTAACCTTTTCATCGTCACTCACTCCTTATAAA
TAATATTCAGGTTCAACTTGATGATGATTCAATGCAAATGTTTCCATAATTTCATTACGA
ATCTTAAGTAGGTGGCTATCATTACGACTGCGTGGATGTGATGCTGTAATTTCATATTGA
GAAATAATATTGCACCCTTCACCTAACAGAACAATGCGGTCGGAAAGATAAATAGCTTCA
TCAATGTCATGCGTCACTAAAATAATAGTTGATTGCGTTTTATGTTTTAGTTGCACTAGT
TGATCCTGAAGTTTATAACGTGTAAATGCATCTAATGCACCTAATGGCTCATCCATCAAT
ATAACGTTAGGCTTATGCACATGCGCTCGACATAGTGCCACACGTTGTTTCATACCCCCG
GACAGTTGCTCGGGAAAATGCTTTCCCCTGTCTTCTAAATCAACTAATTTAAGCTGTGCG
TTAATCTCTTCATCACTAATTTTCTGTTGTAATCCAATCCTAATGTTGTCATTAATCGTT
TTCCATGGCAGCAAATTATGATGTTGAAATAGCATTAAACAATCTGGAGATGGCTGTTGT
TTAATTTCGTTATCAATAATGACACGACCAGACGATGGATGAATAAATCCACCGATAATA
TTGAGTAAAGTAGACTTTCCGCAACCACTTTTCCCTATGAAAGTGACTATTTCTCCCTTG
CTAATGTCCAAATTAAAGTTATGAATTACTTTATGTGATC
LOCUS 104 (GF12)
GATCGCCGATAAGTAAAAACGGTGCATTCATACGTTTCATCATATAATATCCTTCGAAAC
CTTCCGCTGTTCGATAACCACTAAAATATACGTTTAGTGGCGGTTTCATATCACCAGGGT
GGAAATAATAAATAAATTCCTGTCGTTGACTATCTACGAAACGACTACCACCAAGTAAAA
ATTGACCCATGTCTAATCTAGACCATCGTTTGTGTATAGGTCCTAAATGTACCGTCCCGT
TCCCACGCGCCTTAACAGTTACACTTATATAAGCATCAAATGGTTTCGCAGGTATCTCTA
AAGGACTGTCTAACATATCATCAGTCAATACGATTTGTTCAATTAATGCACCATCAGCGC
CAGTCTGAATCAATCTAAATGTATATTGCAACTCGACCGCACCATCAATATCAAATTCTG
GCCATATTTGAATGACTTTATCTTTATCGTAAACGAGATTATTTTGCCAAGATGCGATAG
GTTTAAATTCTTTCCCAAATTCTCCACTCAATGTGAGCTCTGAATTACCTTGGTAAACGA
CATCTCCTTTAAAATTCGGATGCACAAGTGCTAACTTAGGAGAAACCTTATCTCCATACT
GTCCTGAGAAGCTAACTGCCTCTAATTTATTATTACGTTCTTCAATATTCCGGTAATGTA
ATGGTTGAACAACGTATTTTTGGACATTTTCGTCTTGTTCATATTCAACTGACCAAAATG
ATTCATCAACATACGTATTGTATGGTTCGCTTATCATTTGTAATAAATTCGTTAATGTCT
CCGAGTATGGTGCTTGAATATAGATAAAATCAAAGCGCCCTTCTGCTTCAACAATCGCTT
CAATAGCCTCTACATAACCACTATCAAATTCAAACAATCCAATATCGAAGTAATCCCAAC
TCACACCTTTTTTGTGTTGAAAAATAGGTTCTAAATCGTCTCCTCCAATTTGCAAAACTC
TAAATTTACGTGGCATCATTTTCACCTTCTATTAACTCATCGAGCTGATTAATAATATTC
TTAGAAGCATATGCATCTATTAATTTTAAAGAATAGGCGTACGCATAATTCCAATTTTTC
AAATAAAATAAATAATAATTTAACGCATCATCTAATTCATCAACTGTATTTATAATACGG
CCATTGTCATAATCAGAGACGTAATCTGTTTGTTGACCATTAATTTGTGGAATCCCAGCG
CTAATTGCACTAATTTGTAAATACAAGTCAGGTTCTTTTGACATATCTATCACAAGTCGC
AACGTCCGCAATGCTTCTACAACATCATGTTCAGCATGTATCGTCTTAACAGCAATGATG
TCATCTTGATC

LOCUS 105 (E18)
ATCAAAAAGTTATGATGAACGTTTTACGCCGGATGAAGTAGTCGCATACCAACAACATCA
AGGTAATAAATTTAAAGAACATTTTGATTTGAATTGTTATCTGACACTGCTAGATGTATT
GGATAGTCACAACATTGACCGAGGTCGCACAGACGTAACGCATGTTTTTAAAAATTTAGA
AACAAAAGTGTTAACGATGGGGTTCATAGATGATTTGCTATATCCGGATGATC
LOCUS 106 (E101)
CTTCTAACATATTAACCCACTCGTTTGTAGCAGCGTTAAAACCAACACCCGGCTCTGCGT
TTTTCAAACGTTCTACAATAACAGAACCTTCTAATCCTGCATTTTCAGCAATTTGACGAA
CTGGTGCAGTTAATGCTTTAAGTACAATATTTACACCTGTTTCAATGTCACCTTCAGCTT
CAATTTCACTTACTTTTTGGTAAACATTTACTAATGCAGTACCACCACCTGCAACAATAC
CTTCTTCAACTGCTGCACGTGTAGAATTTAATGCATCTTCAATACGTAATTTACGTTCTT
TAAGCTCTGTTTCACTTGCTGCACCTACTTTGATAACTGCAACACCACCTGCTAATTTAG
CTAAGCGCTCTTGTAATTTTTCACGATC
LCOUS 107 (E110)
CGATATCTCCAAATTGTCTAATCAAGACCATTTGTACACCTTGCTTATCATTCTTTTTAT
CACTTAGCATATATTGGTATAACGTTTCAAAATCCAAGTCAGTTATCATGTCTAAAGGAT
AGCCGAGTTGTATTAAATATTGAATATAATGATTAATATCATGCTTAGAATCAAACAAAG
CATTCGCAACTATAAATTGATAGATAATGCCAACCATCACTGCATGACCATGAGGTATTT
TATGATAGTATTCAACAGCATGACCAAATGTATGACCTAAATTTAAAAATTTACGTACAC
CTTGTTCTTTTTCATCTGCAATAACAATATCCAGCTTCGTTTCAATACCTTTAGCAATAT
ATTTATCCATACCATTTAATGACTGTAATATCTCTCTATCTTTAAAGTGCTGTTCGATAT
CTTGCGTCGCTGATTCACCATTCAATAACGCATGCTTATAAACTTCTGCATAGCCACTTA
ATATTTGCTCAAATGGTAACGTCTTTAAAAAGACTAAATCATAAATCACAGCAGTTGGAC
GATAAAATGCACCGATAAGGTTTTTACCTTGCTTTGAGTTAATACCCACTTTACCGCCAA
CACTAGAATCATGCGCTAGTATAGTCGTTGGCACTTGTATAAAGTGCACGCCTCGTAAAA
GTGTCGCCGCAATAAACCCAGCAAAATCACCAGTTGCACCACCACCAACAGCAATAATTG
CTGTATTACGAGTTACATGATGGGATAAAATATACTCTAATGTTTCTTGATATTGCTCAA
ATGTTTTCGTCTTTTCACCAGCTGGAATAATAACTTTATGTACATTTTCATATGATAAAA
TATCATCAAATTTATCAGCAAAATATTGATTTACATGCTCGTCAATTAATATAAAACTTT
GATCAAACTGATCAATATACGTGCTAATATGGTCAATTGCACC
LOCUS 108 (E125)
CACTTTTGAATGTTCACTTCTAAAGATTTGGTCTGTAACTTCCATTTCAGCTAATCCATA
TTTTTCATAAATTTCTTGTCCATAAAGTGTATTTGTATCATGGAATGCTGGTAAACAATG
TAAGAATATCGTTGAATCTTTACCTGTTAAATCAAACATCTGTTGATTCACTTGATAGTC
TTTTAATAAATTAATACGTTGTTCAAATTCACTTTCTTCACCCATCGATACCCAAACATC
TGTATATATAGCATCTGTATTTTCAACTGCTTCTGCAATATTATCCGTAATCATGACTGA
ACCACCATATTGACTCGCTTTTTCTTTTGCAATATCAACATATGCCTCTTTTGGATTTAA
TGATTTAGGTGTACAAATTCTTACATTAACACCTAACATAGCACCTGCTACCATTAATGA
ATGCGCAATATTATTACGTCCATCTCCAACGTAAGTTAAGTTTATTCCTTCTAGATATCC
AAAATTCTCTTTTATTGTCATAAAATCAGCTAACATTTGTGTAGGATGCCAATCGTCTGT
TAATCCATTCCACACCGGTACACCAGAGAACTTCGCTAAATCTTCAACAGCTTGTTGTGA
AAAACCACGGAATTCAATACCATCGAACATTCTACCTAATACTTTCGCAGTATCCTCTAC
AGATTCTTTTTTGCCTAATTGAATATCATTTTTTCCTAAAAATTCTGGATGCGCACCTAA

ATCAATAGACGCAACTGTAAACGCAGCACGCGTTCTCGTCGAATTCTTTTCGAATAGTAG
TGCAATATTTTTTCCAGATAAGTAGTGATGCTTAATACCGTTTTTCTTATACTCTTTTAA
TGTAATTGCAAAATCAATAAGTCCTTCGAATTCTGCTTTGGTAAAATCACTTTCTTTTAA
TAATGATCTGCCTTTTAAATCATACGGTTTTTGAATTTCTGTCATTATTTTCACCCTCGT
TTCTATAATTTATTACGTTAAATGTCCTCTCTGAATAATGGTTGACTCATACATCTAGGG
CCCCCACGTCCACGTACCAACTCGCTACCAGATATTTCAATGACTTTAATGCCTTTTTGT
CTCAATAAATCATTCGATACATAGTTTCTATCGTAAGTCACTACAACGCCTGGTCTTATA
CATAATGTATTTGAGCCATCATTCCATTGCTCTCTAGCACCATCAATGACATCACCATTT
CCTGTTGGAATGAATTGGATATCATCTATACCTAGTACGTCTTCTAAAGTATCTTTTAAA
TGACTAGATTGTTTGATGGCAATATCTTTATTTACGTCATCATATTCAATAATAAATATA
TTCATATTGCCTTCTGCCTTTAAAATGGCTGAATGCATTGTAAATTTGTCATAATCTATC
ATTGTAAATACTGTATCTAAGTGCATAAAAGTTCGACTAGTTGGAATTTCAATTGCTACT
ACTTTTTTAAACGTCGCCTGCGGATTTTCAAAAATACGTCGCGCTAACTTTTCAATAGCT
TGTGCAGATGTACGTTCTGAAACGCCTATAGCCAAGACATCTTTAGATAAAACAAGTTCA
TCGCCGCCTTCAATATTGAATGGGCAATCTCGATC

LOCUS 109 (F101)

CAATACCTTGTGGACAAATAAGTATGACATCTTGATTATCTACATTAAAGTAATCTGGGC
ATTCCCACATATATCCAAAATCATCCAACTCTGTATTTATTTCACCTAAATAATGCCAAT
TAATTATATCTTCAGTATTATAAAGTAATAATCGACCTTGCTGATCATTATTTTGTGCAC
CAATGATTGCATAATATTTCTCATCATATTTAAAAACTTTAGGATCTCTAAAATGACTCG
TATATCCTTCTGGTTGTTGGCTAATTACTGGCTTTGGAAACTTTTCAACTGAACCGTCTT
CTTTCAATCGTGCGATCATCTGACTCGCATGTCGTTGCCAATGATTATCTCGATGATTTC
CTGTGTACATATAATATAAATGCCCGTTATATTCAAAAGCGCTACCGCTATATACACCAT
GGCTGTCATATTTAGTATCTGGATTTAAAATTGGCCCTTCAGCTTTAAAGTTTATTAAGT
CATCACTCGTGTAGTTATACCAATACTTTAAGCCATGTACTGCGCCTAATGGGAACCATT
GATGTGAAACATAATACTTCCCTTTATAAAAAATAAGTCCGTTGGGGTCATTTAATAAGC
CTGTTTCTGGTTGTATATGAAATTGTTGACGAAATTTTGATTGATCAACTTGTTGTTTTA
ATGTTTTAAAATACTCAGTATCAACGTCCTCGATTCGTTGATAACGTTCTTCTCTAGTCC
ATTCGGTCATAATATTTACCCAGTCCTCCTTTTATAATTTATGCTGTTAACAATTTATAT
TCTATTATAGCAAATTTTACCTACGTTCTTTAACTTTTAACCTATCCATTTATAGTTATA
TGGTATCGGTTCCACATTTATTTTAAAAAATACAGCGTCTAAATATTAACATCTACTGTG
ACGCTATATGGCATATCTTGCTTTTTAAGCATCTGTTGTATCTCTTCCATCGCGCATTGG
CCAGCTTCAAAATAATTATAATGAATTGTTTTTATCGATGGAGACACTAATTGTGTCATT
GGGTCACCACCAAAACCATATATTTGATGTGGTTTCATAACATCTTTTTTATCAGAATAA
TATTTATAGGCAGCTAATGCAATCGTATCAGTTGCTCCAACAACCGCATCTACTTGCTCC
ACATTTTCCAAAACATTTGCAACATCTTTTTGTGCTTCCACATAAGTAAAATTTGTTTCA
TGTATATTAGGTTTAATTTGGTATTTAGCTAACTGGTCAAGTAAACCACGTTTTCTATGT
ATACCAACTGCAATATCTTTTTCACTTACACTAAACACTTCAACTTGTTGATATCCCTGT
TGACCAATCCATTCGCCTATAATTTGACCTGCTTTATAATCATCATGCACAATACTATGA
AGTTGTTCATGTTGTTGACCAACAATAACGATTGGTACATTCATTTTATTAATGACTTCA
ATATGTCTCTCTGTTATGTCTGTAGCCATTAAAACAATACCATCTACTTTACTGCGTGCT
AATGTTTCAAGCGCTTGTATTTCTGCTTCGATATTTAAACCTGTGTAATTTAAAATTAAT
TGTGATTCATATTTTTGGCATTGTTTTGCCAATCCTTTGATTGTTTCATCTACTGCATAT
GAATTCATTCTAGGTATAATGGCACCAATAAGGTGTGTTTGTCTCGCTCTTAAACTTTGA
GCAAATTGATTCGGTTGATAGTCATGTTCTGCTATAATTCTTGTTAATTTTTCACTTGTT
TTTTTACTGACAGATCCATTATTTAAAAATCTAGATACTGTACTTTTTGAAACGCCTGCC
AATTTGGCAATATCAGATATATTTTTCATACTTATTCACCTATCATTATTTGTGACACTT
AGCCTTATTTTAGCATATGTGTAACCGCTTTAAATAATATTTCTGCTTCTTTCATAAAAA
GATTTCAAAATAAAACTTTTGTATAACAAAATGTCCCAACATCAACCTTTAGTTAAATGT
CAGGACAATGAATATTCTATGTAAATATATTCTAATATCGAATATGTTTATTGAATCTAT
TTAGCTCACCTTCAAAGTAAGCATGTTCACCGTGAACAATCTTGTCTAATCCTATATTCG

TTTCTTGTTCCGTAACAGATAATGGTGTAATTAATTTAATTACTTTCGCAATAATAAACG
TCATGACTATACTAAAAATTACAACTGCTGTTACACATAATATTTGTACAAGTATAATAT
GTATGTCACCAGTATAAATAAAGCCATTCTCAATGTCAGGATTGGCTTTTTTACTTTGGA
AAACTGCTGTTAAAACAGCACCAATAATACCACCAACACCATGAATACCAAATGCATCTA
ATGCATCATGATATTTTAGTTTTACCTTGATGTAATTAATGACAATATAACAACAGATAC
CTCCTATTAAAGCCATTATTGTTGCACTAAGATATGTTACATATCCTGCTGCAGGAGTAA
TGACAACTAATCCTGCTAATGCACCGAGTAAAAGTCCAAGTAAACTTGTCGTCTTTTTAA
AAATATATTCTAAAATTAACCAACCTATAGCACCTGCACTGGCTGAAATGACAGTATTTG
TAAATGCAAGCATCGCAATATTATCAAATGTAAAAGCACTACCTACATTAAATCCATACC
AACCAATCCACACGAATATACCGCCAATCAACGTAATGATAAGATTATGTGGTGTTGATT
CAGAATGTTTGTTTCCTTTTCCAATCATAATAGCTAATACTAAACCAGAAACACCTGATG
TAATATGAACAACCGTACCTCCAGCGAAATCTAATACACCGAGTTTGTTAATCCAACCGC
CGCCCCAAACCCAATGTGCTACTGGACTGTATACAAGAGCAGTCCATATTACTACGAATA
ATAAATAAGGAATAAACTTCATTTTCTCAGCGATTGAACCAGATAAAATAGAAATTGCAA
TCGTACAAAACATCATTTGAAATAACATAAACAAAGCGAAAGGAATATGTGGGCTAATAT
CTTCTTGAGTCGCAAAACCTACATGATTAAGAAAAGTATATTCCCAATTTCCGAACCATA
AATTCCCATTCCCAAAACTAATTGTAAAACCAACTGTTATCCATACAAATGTAACAAGCA
CAATTGCTGCCATACTTTGCATGACAGTATTAAGCGCATTTTTAGATTGAACTAACCCAC
CATAAAATAAACTTAATCCTGGTGTCATTAACCAAACTAATAATGTACACAAAAACATAA
ATATCGTATCGTTAAGATTCATACTTACCACTCCCTTTTTTTCATAATAATCTGACAATT
TATAAAAAGCAAAAATGCGTTAAGTTTTATTACATCTTTTGGAATAAAATGTGCCACACT
ATATAAAAATGATTTCATGAACTAAAAAAAAAAAGACTACTTACTCACTTTTAAATTAGC
GGAAGTAGCCATAGAATCTAATATCTATTTTATTGTTAAAATGATAACGTTAAACTTTTT
GAATTGTAATTGTCCATGAAGCATTATCAATTTGTTCATAGTTTGTTACAGGATAACCAT
TTTCTGCAGCCCAATTTGGAATGGCTTCCGTCGCTTGCGTGCAATCAAAATCAATTTTTA
ATTCATCTCCAGATTGCAATGTTGCCATTTTCTTTTGCGCTTCAATTAACGGAAATGGAC
ATACCATTCCTACTGTACCTAATTCGTGTATCATAATTATTTCTCCTTTTCCAATCACTT
TTATTTGATC
LOCUS 110
GTCTCTTTCAACAACCGCGTCATATTTTTCAACATAACCTTTTTTGATAAGTCCATCTAA
ACTGGATTTTGAAAAGCCCATATCCTCAATATCAGTTAAAAATATTGTTTTATGTTGTTC
TTCAGACAAGTAAGCATACAAATCGTATTGTTTAATAACTTTCTCCAACTTAGCTAATAC
TTCATCAGGATGATACCCTTCAATGACACGAACAGCACGCTTGGTTTTTTTAGTTATATT
TTGTGTGAGAATCGTTTTTTCTTCAACGATATCATCTTTTAACAACTTCATAAGCAATTG
AATATCATTATTTTTTTGCGCATCTTTATAATAATAGTAACCATGCTTATCAAATTTTTG
TAATAAAGCTGAAGGTAGCTCTATGTCATCTTTCATCTTAAATGCTTTTTTTATACTTCGC
TTTAATAGCACTCGGAAGCATCACTTCTAGCATAGAAATACGTTTAATGACATGAGTTGA
ACCCATCCACTCACTTAAAGCTATTAATTCTGATGTTAATTCTGGTTGTATATCTTTCAC
TTCTATGATTTTTTTTAACTTCGAAACGTCAAGTTGTGCATCAGGTTCTGCTGTTACTTC
CATTACATAACCTTGAATCGTTCTTGGTCCAAAAGGTACAATTACACGCACACCAGGTTG
GATGACAGATTCGAGTTGTTCGGGAATTATATAATCAAATTTATAGTCAACGCTCTTCGA
CGCGACATCGACTATGACTTTCGCTATCATTATTGCCAC
LOCUS 111
GCGTTGTGAATTAGTATAATCAATTTACTGGAAGATATTTAGTCGATTGATACCTATCAA
CTATTTTCAGCATACGATAAATTATAACAAATCATAGTTTATTATCACACTTAATTATTA
TATTTTTCAAGGGAGAATACGAAATATGCCTAAAAATAAAATTTTAATTTATTTGCTATC
AACTACGCTCGTATTACCTACTTTAGTTTCACCTACCGCTTATGCTGATACACCTCAAAA
AGATACTACAGCTAAGACAACATCTCATGATTCAAAAAAATCTAATGACGATGAAACTTC
TAAGGATACTACAAGTAAAGATATTGATAAAGCAGACAAAAATAATACAAGTAACCAAGA

CAATAACGACAAAAAATTTAAAACTATAGACGACAGCACTTCAGACTCTAACAATATCAT
TGATTTTATTTATAAGAATTTACCACAAACCAATATAAACCAATTGCTAACCAAAAATAA
ATACGATGATAATTACTCATTAACAACTTTAATCCAAAACTTATTCAATTTAAATTCGGA
TATTTCTGATTACGAACAACCTCGTAATGGCGAAAAGTCAACAAATGATTCGAATAAAAA
CAGTGACAATAGCATCAAAAATGACACTGATACGCAATCATCTAAACAAGATAAAGCAGA
CAATCAAAAAGCACCTAAATCAAACAATACAAAACCAAGTACATCTAATAAGCAACCAAA
TTCGCCAAAGCCAACACAACCTAATCAATCAAATAGTCAACCAGCAAGTGACGATAAAGC
AAATCAAAAATCTTCATCGAAAGATAATCAATCAATGTCAGATTCGGCTTTAGACTCTAT
TTTGGATCAATACAGTGAAGATGCAAAGAAAACACAAAAAGATTATGCATCTCAATCTAA
AAAAGACAAAAATGAAAAATCTAATACAAAGAATCCACAGTTACCAACACAAGATGAATT
GAAACATAAATCTAAACCTGCTCAATCATTCAATAACGATGTTAATCAAAAGGATACACG
TGCAACATCATTATTCGAAACAGATCCTAGTATATCTAACAATGATGATAGCGGACAATT
TAACGTTGTTGACTCAAAAGATACACGTCAATTTGTCAAATCAATTGCTAAAGATGCACA
TCGCATTGGTCAAGATAACGATATTTATGCGTCTGTCATGATTGCCCAAGCAATCTTAGA
ATCTGACTCAGGTCGTAGTGCTTTAGCTAAGTCACCAAACCATAATTTATTCGGTATCAA
AGGTGCTTTTGAAGGGAATTCTGTTCCTTTTAACACATTAGAAGCTGATGGTAATCAATT
GTATAGTATTAATGCTGGATTCCGAAAATATCCAAGCACGAAAGAATCACTAAAAGATTA
CTCTGACCTTATTAAAAATGGTATTGATGGCAATCGAACAATTTATAAACCAACATGGAA
ATCGGAAGCCGATTCTTATAAAGATGCAACATCACACTTATCTAAAACATATGCTACAGA
TCCAAACTATGCTAAGAAATTAAACAGTATTATTAAACACTATCAATTAACTCAGTTTGA
CGATGAACGCATGCCAGATTTAGATAAATATGAACGTTCTATCAAGGATTATGATGATTC
ATCAGATGAATTCAAACCTTTCCGTGAGGTATCTGATAGTATGCCATATCCACATGGCCA
ATGTACTTGGTACGTATATAACCGTATGAAACAATTTGGTACATCTATCTCAGGTGATTT
AGGTGATGCACATAATTGGAATAATCGAGCTCAATACCGTGATTATCAAGTAAGTCATAC
ACCAAAACGTCATGCTGCTGTTGTATTTGAGGCTGGACAATTTGGTGCAGATCAACATTA
CGGTCATGTAGCATTTGTTGAAAAAGTTAACAGTGATGGTTCTATCGTTATTTCAGAATC
CAATGTTAAAGGATTAGGTATCATTTCTCATAGAACTATCAACGCAGCTGCCGCTGAAGA
ATTATCATATATTACAGGTAAATAAGTATTATATTAAACCCGTAAAATTTATAAGTATAA
ACAAGGAGTTCGGACTTAAACATATTTCTGTTCATAAGTCCGATTTCTTATTCAATTAAA
CCCGAGGCATTCAGTTCGAACGCCTCGGGTCGTTTTATATAAATATATTATTTTATGTTC
AAATGTTCCTCATCATATCCGTTTCAATTGCCATCTCACACATTTTATAAATATGAGCAA
ATGTACTTATTCTCAAACATTACTGCCGAGCTTTAATTGACGTTATATTAACTATAAACT
ACTTTTCCATGACTCTACGGATTCAATGTCACATGAGCGTGATAAAATTTGTTCAATAAT
AAAGTCATGTTTATCATCTGA
LOCUS 112
ATAATATTTAAGCCTACACTAGCTAACATACCAATCATAGAAACCATTGGTGCCCCAATT
GCACGTGCAAATTGTTCTAATATGAAGAACAAAATTACAAAAGGTGCACTTAAAAACATT
ACTTTCAAATAATTACTTGTTAAAGCTAACGTTTCACCTCTCGCCCCTAAAATTGCTGCG
ATTTGATCACTGAATGGTAAAGTAACTAAAATCACGATAAGTCCTAGTGCAATACCACCA
TAAATAGAGAAACTACTTACAAATTTACTCTTACTATAGTCTTTCGCACCTAATAAACGT
GAAATATAAGTTCCTGCACCAACGCCAAATAAATTACCTAACCCCATTAAGATAGCAAAT
ACTGGCAGTGTTAGAGAGATAGCAGAAATCATGTGGCTATCTTCTAAAAATCCTATAAAG
TAAATATTTAATATGCCATAAATAACGCTTAATAAAGTCCCTATCATCATTGGCAATGAG
AAATGCATCATCGCTTTAAATACTGGCGATTTCTCAAAATAATATAATTGTTCGTCTTTC
ATTGTTCAATACTCCTTGTCTTTTCCAATAATTAGCTTACTAACAATTAGATATCTAACT
ATAATATTAAAGACAAAGTGACTGATTTCTACCAGTCACACTTATCATTTATTGTAAACT
AGATAACATTTTAGTTAAGTTTGCTTTCATTTGTTCATTTTCTTCTTCAGATAACTGCGA
TACGAGTGTTTGTTCCATTTCATCAAATATCGAAGTGAATGCTTCTACGAGTTTAATCCC
AGAGGTAGTCAGCCCTATATTCTTTCTTCTCGTATCTTGTGCATCGACATAGCGATAGAT
CAGCTTTTTACGTTCAAGGTTCCTTAATAAATTACTGACAGTTGGACCTGTTCGTTGTAA
TGCTTTAGCAATATCATTTTGTGTCAGTCCATCTTGTTGATGTGCATAAAGATAACCTAA

CGTATGACCTTG
LOCUS 113
GATCCTTCAGAAATCAATAAAGTTATTCATGTAGATTTAGGTATTATTGCAGACTGTAAA
AGATTTTTAGAATGTTTAAATGATAAAAATGTTGAGACTATAGAACACAGTGACTGGGTT
AAACATTGTCAAAATAATAAGCAGAAACACCCATTTAAACTTGGTGAAGAAGATCAAGTA
TTTTGTAAGCCACAACAAACAATCGAATATATCGGCAAAATTACAAATGGTGAAGCAATT
GTTACTACAGACGTGGGACAACATCAAATGTGGGCAGCTCAATTTTATCCATTTAAAAAT
CACGGACAATGGGTTACAAGCGGTGGTTTAGGAACAATGGGATTCGGTATTCCTTCGTCA
ATTGGTGCCAAATTAGCTAATCCTGATAAAACAGTCGTATGTTTCGTCGGTGACGGTGGT
TTCCAAATGACAAACCAAGAAATGGCACTTTTACCCGAATATGGTTTAGATGTCAAAATC
GTACTAATCAATAATGGAACATTAGGTATGGTTAAACAATGGCAAGATAAGTTCTTTAAT
CAACGCTTCTCACACTCAGTATTTAATGGTCAACCTGATTTTATGAAAATGGCAGAAGCA
TATGGCGTCAAAGGTTTCTTAATCGATAAGCCAGAACAACTGGAAGAACAATTAGATGCA
GCGTTTGCTTATCAAGGACCAGCTTTAATTGAGGTTCGTATTTCCCCTACTGAAGCTGTA
ACCCCAATGGTTCCGAGTGGCAAATCAAATCATGAAATGGAGGGCTTATAATGACAAGAA
TTCTTAAATTACAAGTTGCGGATCAAGTCAGCACGCTAAATCGAATTACAAGTGCTTTTG
TTCGCCTACAATATAATATCGATACATTACATGTTACACATTCTGAACAACCTGGGATTT
CTAACATGGAAATTCAAGTCGATATTCAAGATGATACATCACTTCATATATTAATTAAAA
AATTAAAACAACAAATTAATGTTTTAACGGTTGAATGCTACGACCTTGTTGATAACGAAG
CTTAATTTTAAGACAAAGGCAATGATGCGCTAATTAGTTATAGATATATCATAGGCTGCT
AGTTAACATCTGCCACTATTACAAAGTTATATTTCAGAATTTTCGAAACACAAAATATTT
AATTATTTGGAGGAATTTATTATGACAACAGTTTAT
LOCUS 114
GCGCACCAAACTCTCGTCCAATTGATTTTGAAATGAAAAAGAAAGATGGAACTCAACAGT
TTTATCATTATGCAAGTTCTGTTAAACCTGCTAGAGTTATTTTCACTGATTCAAAACCAG
AAATTGAATTAGGATTACAATCAGGTCAATTTTGGAGAAAATTTGAAGTTTATGAAGGTG
ACAAAAAGTTGCCAATTAAATTAGTATCATACGATACTGTTAAAGATTATGCTTACATTC
GCTTCTCTGTATCAAACGGAACAAAAGCTGTTAAAATTGTTAGTTCAACACACTTCAATA
ACAAAGAAGAAAAATACGATTACACATTAATGGAATTCGCACAACCAATTTATAACAGTG
CAGATAAATTCAAAACTGAAGAAGATTATAAAGCTGAAAAATTATTAGCGCCATATAAAA
AAGCGAAAACACTAGAAAGACAAGTTTATGAATTAAATAAAATTCAAGATAAACTTCCTG
AAAAATTAAAGGCTGAGTACAAGAAGAAATTAGAGGATACAAAGAAAGCTTTAGATGAGC
AAGTGAAATCAGCTATTACTGAATTCCAAAATGTACAACCAACAAATGAAAAAATGACTG
ATTTACAAGATACAAAATATGTTGTTTATGAAAGTGTTGAGAATAACGAATCTATGATGG
ATACTTTTGTTAAACACCCTATTAAAACAGGTATGCTTAACGGCAAAAAATATATGGTCA
TGGAAACTACTAATGACGATTACTGGAAAGATTTCATGGTTGAAGGTCAACGTGTTAGAA
CTATAAGCAAAGATGCTAAAAATAATACTAGAACAATTATTTTCCCATATGTTGAAGGTA
AAACTCTATATGATGCTATCGTTAAAGTTCACGTAAAAACGATTGATTATGATGGACAAT
ACCATGTCAGAATCGTTGATAAAGAAGCATTTACAAAAGCCAATACCGATAAATCTAACA
AAAAAGAACAACAAGATAACTCAGCTAAGAAGGAAGCTACTCCAGCTACGCCTAGCAAAC
CAACACCATCACCTGTTGAAAAAGAATCACAAAAACAAGACAGCCAAAAAGATGACAATA
AACAATTACCAAGTGTTGAAAAAGAAAATGACGCATCTAGTGAGTCAGGTAAAGACAAAA
CGCCTGCTACAAAACCAACTAAAGGTGAAGTAGAATCAAGTAGTACAACTCCAACTAAGG
TAGTATCTACGACTCAAAATGTTGCAAAACCAACAACTGCTTCATCAAAAACAACAAAAG
ATGTTGTTCAAACTTCAGCAGGTTCTAGCGAAGCAAAAGATAGTGCTCCATTACAAAAAG
CAAACATTAAAAACACAAATGATGGACACACTCAAAGCCAAAACAATAAAAATACACAAG
AAAATAAAGCAAAATCATTACCACAAACTGGTGAAGAATCAAATAAAGATATGACATTAC

CATTAATGGCATTATTAGCTTTAAGTAGCATCGTTGCATTCGTATTACCTAGAAAACGTA
AAAACTAATAAATCGTCTTTATATTTAATTATTAAATTAACAAATTTTAATTGGCGGATG
AGGTATCCAGTTACCTCGTTCGCCAATTATTTTTCGCAATATAAAAAGTCCCACTTAAAA
CAATCATTTTAAGCGGGACTTTTTATATTGAGTAACTAAAATTATTTAGCTGCTACTTCT
TCGCCATTGTAAGAACCACAGTTTTTACATACACGGTGTGATAATTTGTATTCGACCACA
GTTTGGGCATTCAGTCATACCTGGTACTGAAATTTTGAAATGCGTACGACGTTTGTTTTT
TCTAGTTTTAGAAGTTCTTCTTTTTGGTACTGCCATGATATATCCTCCTTAGATTATAAA
CGAAAAATACTAAATGTTAGTTTAATTAACAACATTATATCATTAATTAAACTACTTATT
GCTCTTTATCATATAATTGTTGTAATTTTTGAAGCCTTGGATCAACTTGTCGTGATTCTG
AATCATCTTGTTGCTTGCTGTTTAGCAAGCTCATCTAATTGATCCTCATCGATTACTTCC
CAACCATTACCTACTGTCAACATTTGGTCACTTTGCTCTGAATAAGCTCTCATTGGTTTC
TCAATAATAACTATATCCTCGACAATATCCTGAAGATTAACCATACCATCTTTAATAATG
TGATAGTGTTCATCTACATCATCTTGATC
LOCUS 115
GGATCTGATATTTTATCAATGTGCTTGTCATCTTTTTTAATATCATCTAACGTTTTCTTA
ATATCTTTAGTAATGTTCGGTTGCACAATACCATCATCTTTAGTCGTCTTAAAGACAACA
CGTATTTGTGCCTTTTCACTATCTTGATTAAAATGTTTTTCAATCTTTTTATTCGTATCT
AACGACTCTAATCCTGTCATTTTAATATCATTGTCAAATTTCGGTGCATTTGTAGCAAGT
GGTATCAATATTGCAGCTACAATCACTATCCATGCAATGACCGCGGACCATTTATGTTTT
GCGATGAATGTCCCCATCTTATATAAAAATTTTGCCAAAGTATATTGCCTCCTTTTAAAA
TCAACGTTATAGTTTAAATATACAGTGTAGATTATTGTTCGATTATAGTATCTATCCCCG
ACCTCTTAAAGAATCAATTGGAAAATTTTGTATATTAAACTACACACAAAGGAGAAATGT
AGATGAAAGAGACTGATTTACGAGTTATAAAGACAAAAAAAGCATTGTCGAGTAGCTTGC
TACAATTGTTAGAACAGCAATTATTCCAAACGATTACTGTCAATCAAATTTGCGACAACG
CACTCGTACACCGTACAACATTTTATAAACATTTTTATGATAAATATGATCTTCTAGAGT
ACTTGTTCAATCAATTGACTAAAGACTACTTTGCTAGAGATATCAGTGACCGTCTTAATC
ATCCATTCCAAACGATGAGTGATACGATTAATAATAAAGAGGATTTGAGAGAAATCGCAG
AATTCCAAGAAGAAGACGCTGAATTTAATAAAGTATTAAAAAATGTCTGCATTAAAATTA
TGCATAACGATATCAAAAATAATAGAGACCGTATCGATATTGACAGCGACATCCCAGATA
ATCTCATATTTTATATTTATGACTCGTTGATTGAAGGTTTTATACATTGGATAAAAGATG
AAAAAATTGATTGGCCTGGCGAAGATATTGATAACATTTTCCATAGATTAATCAATATTA
AGATTAAATAGTAGATGAGAAACTCATGAGCGTTACCAACATTCATAATAAAAACGATAG
TGTACACGTTAATGAATTCGTGTACTACTATCGTTTTTTATTTTTATCGTGCTTATCGCT
ATTAAAACAACTGATACACAACACATAAACTATGAAGAAAAAAATAAATCCGCTATCTAA
ATGACTTTGACTCAGTTGTTTAAATGACCAAATTGCTAATACAATTCCCATTATTATTGA
AATAACGTATCTCACATTCTTATACCTATAATCCTTTTCTAAAAATATGGTTGCTATTAC
TTAATTTTTAAAGTTATAAATAAAAAGAGCCAACCGCAATGGATGGCCCTTGTTCATTAT
GAAGCATTAGAACATTTCTGAAACAACCTTTTGTTCTAAGAAGTGTAATAAGTAGTCTGG
ACTACCTGTTTTAGCGTCCGTACCTGACATTTTGAAACCACCAAATGGATGGTATCCAAC
AACTGCTGAAGTACAGCCTCTGTTAAGGTATAAATTGCCTACATCAAATTCGTTTACCGC
TTTAATCCAATGCTCGCGATTATTTGTAATCACTGCACCAGTTAAACCGTAATCTGTATC
ATTTGCAACCTCAATTGCTTCATCAAAATCGTTAACTTTCACAAAGCCAACAACTGGACC
AAAAATTTCTTCTTGCATGATTCTATCTTTAGATTTAAGTCCTGAAATGATTGTTGGTTC
TACAAAGTAACCTTTTGAATCATCAGTGCCGCCACCTTGTTCTAATTTACCTTCTTCTTT
ACCAATCTCAATATAATTTTTAATCTTATCAAATTGTTTTTTTATTAATAACTGGGCCCAT
ATACGTATTGTCTACAGTATTGCCCAACGTTAATTCTTTTGTTAATTTGATTGATTTCTC
TAATACTTCGTCATAAACGTCTTTATGCACAATTGCACGTGAACATGCTGAACATTTTTG
ACCAGAAAAACCAAATGCTGACGTTACAATAGCTTCTGCTGCCATATCTGTATCAATATT
TTCATCAACTACAATGGCATCTTTACCACCCATTTCAGCGATAACACGTTTCAAGAAGTT
TTGACCTTCTTGAACAACGGCACTACGTTCATAAATTCTAGTACCTGTCGCACGTGATCC
TABLE 8

LOCUS 1 (E8/B1/I16)
>G1832_STAAU8325, UNDEFINED PRODUCT 1724158:1725096 REVERSE MW:34671
MEHTTMKITTIAKTSLALGLLTTGVITTTTQAANATTLSSTKVEAPQSTPPSTKIEAPQS
KPNATTPPSTKVEAPQQTANATTPPSTKVTTPPSTNTPQPMQSTKSDTPQSPTTKQVPTE
INPKFKDLRAYYTKPSLEFKNEIGIILKKWTTIRFMNVVPDYFIYKIALVGKDDKKYGEG
VHRNVDVFVVLEENNYNLEKYSVGGITKSNSKKVDHKAGVRITKEDNKGTISHDVSEFKI
TKEQISLKELDFKLRKQLIEKNNLYGNVGSGKIVIKMKNGGKYTFELHKKLQENRMADVI
DGTNIDNIEVNIK
>G1834_STAAU8325, UNDEFINED PRODUCT 1725193:1725327 REVERSE MW:5264
MFVKVAFLCLKSDETSNVPSVESHQNHFYLTNIMDFLIYLTMIQI
>G1835_STAAU8325, UNDEFINED PRODUCT 1725449:1726531 REVERSE MW:40775
MEHTIMKMRTIAKTSLALGLLTTGAITVTTQSVKAEKIQSTKVDKVPTLKAERLAMINIT
AGANSATTQAANTRQERTPKLEKAPNTNEEKTSASKIEKISQPKQEEQKTLNISATPAPK
QEQSQTTTESTTPKTKVTTPPSTNTPQPMQSTKSDTPQSPTIKQAQTDMTPKYEDLRAYY
TKPSFEFEKQFGFMLKPWTTVRFMNVIPNRFIYKIALVGKDEKKYKDGPYDNIDVFIVLE
DNKYQLKKYSVGGITKTNSKKVNHKVELSITKKDNQGMISRDVSEYMITKEEISLKELDF
KLRKQLIEKHNLYGNMGSGTIVIKMKNGGKYTFELHKKLQEHRMADVIDGTNIDNIEVNI
K
>G1837_STAAU8325, UNDEFINED PRODUCT 1726810:1727562 REVERSE MW:28926
MYDSNYVIKQSNYNRLEHTTMKMKNIAKISLLLGILATGVNTTTEKPVHAEKKPIVISEN
SKKLKAYYNQPSIEYKNVTGYISFIQPSIKFMNIIDGNSVNNIALIGKDKQHYHTGVHRN
LNIFYVNEDKRFEGAKYSIGGITSANDKAVDLIAEARVIKEDHTGEYDYDFFPFKIDKEA
MSLKEIDFKLRKYLIDNYGLYGEMSTGKITVKKKYYGKYTFELDKKLQEDRMSDVINVTD
IDRIEIKVIKA
LOCUS 2 (B10/I15)
>G0678_STAAU8325, UNDEFINED PRODUCT 661503:665291 FORWARD MW:138168
MLGVINRMAKKFNYKLPSMVALTLVGSAVTAHQVQAAETTQDQTTNKNVLDSNKVKATTE
QAKAEVKNPTQNISGTQVYQDPAIVQPKTANNKTGNAQVSQKVDTAQVNGDTRANQSATT
NNTQPVAKSTSTTAPKTNTNVTNAGYSLVDDEDDNSENQINPELIKSAAKPAALETQYKT
AAPKAATTSAPKAKTEATPKVTTFSASAQPRSVAATPKTSLPKYKPQVNSSINDYICKNN
LKAPKIEEDYTSYFPKYAYRNGVGRPEGIVVHDTANDRSTINGEISYMKNNYQNAFVHAF
VDGDRIIETAPTDYLSWGVGAVGNPRFINVEIVHTHDYASFARSMNNYADYAATQLQYYG
LKPDSAEYDGNGTVWTHYAVSKYLGGTDHADPHGYLRSHNYSYDQLYDLINEKYLIKMGK
VAPWGTQSTTTPTTPSKPTTPSKPSTGKLTVAANNGVAQIKPTNSGLYTTVYDKTGKATN
EVQKTFAVSKTATLGNQKFYLVQDYNSGNKFGWVKEGDVVYNTAKSPVNVNQSYSIKPGT
KLYTVPWGTSKQVAGSVSGSGNQTFKASKQQQIDKSIYLYGSVNGKSGWVSKAYLVDTAK
PTPTPTPKPSTPTTNNKLTVSSLNGVAQINAKNNGLFTTVYDKTGKPTKEVQKTFAVTKE
ASLGGNKFYLVKDYNSPTLIGWVKQGDVIYNNAKSPVNVMQTYTVKPGTKLYSVPWGTYK
QEAGAVSGTGNQTFKATKQQQIDKSIYLFGTVNGKSGWVSKAYLAVPAAPKKAVAQPKTA
VKAYTVTKPQTTQTVSKIAQVKPNNTGIRASVYEKTAKNGAKYADRTFYVTKERAHGNET
YVLLNNTSHNIPLGWFNVKDLNVQNLGKEVKTTQKYTVNKSNNGLSMVPWGTKNQVILTG
NNIAQGTFNATKQVSVGKDVYLYGTINNRTGWVNAKDLTAPTAVKPTTSAAKDYNYTYVI
KNGNGYYYVTPNSDTAKYSLKAFNEQPFAVVKEQVINGQTWYYGKLSNGKLAWIKSTDLA

KELIKYNQTGMTLNQVAQIQAGLQYKPQVQRVPGKWTDAKFNDVKHAMDTKRLAQDPALK
YQFLRLDQPQNISIDKINQFLKGKGVLENQGAAFNKAAQMYGINEVYLISHALLETGNGT
SQLAKGADVVNNKVVTNSNTKYHNVFGIAAYDNDPLREGIKYAKQAGWDTVSKAIVGGAK
FIGNSYVKAGQNTLYKMRWNPAHPGTHQYATDVDWANINAKIIKGYYDKIGEVGKYFDIP
QYK
LOCUS 3
>G1419_STAAU8325, UNDEFINED PRODUCT 1379120:1380817 FORWARD MW:61188
DRKPVTVADLKVEGALAMILKDAIKPNLVQSIEGTPALVHGGPFANIAHGCNSILATETA
RDLADIVVTEAGFGSDLGAEKFMDIKAREAGFDPAAVVVVATIRALKMHGGVAKDNLKEE
NVEAVKAGIVNLERHVNNIKKFGVEPVVAINAFIHDTDAEVEYVKSWAKENNVRIALTEV
WEKGGKGGVDLANEVLEVIDQPNSFKPLYELELPLEQKIEKIVTEIYGGSKVTFSSKAQK
QLKQFKENGWDNYPVCMAKTQYSFSDDQTLLGAPSGFEITIRELEAKTGAGFIVALTGAI
MTMPGLPKKPAALNMDVTDDGHAIGLF
>G1420_STAAU8325, UNDEFINED PRODUCT 1381154:1383838 FORWARD MW:100947
MNKHHPKLRSFYSIRKSTLGVASVIVSTLFLITSQHQAQAAENTNTSDKISENQNNNATT
TQPPKDTNQTQPATQPANTAKNYPAADESLKDAIKDPALENKEHDIGPREQVNFQLLDKN
NETQYYHFFSIKDPADVYYTKKKAEVELDINTASTWKKFEVYENNQKLPVRLVSYSPVPE
DHAYIRFPVSDGTQELKIVSSTQIDDGEETNYDYTKLVFAKPIYNDPSLVKSDTNDAVVT
NDQSSSVASNQTNTNTSNQNISTINNANNQPQATTNMSQPAQPKSSTNADQASSQPAHET
NSNGNTNDKTNESSNQSDVNQQYPPADESLQDAIKNPAIIDKEHTADNWRPIDFQMKNDK
GERQFYHYASTVEPATVIFTKTGPIIELGLKTASTWKKFEVYEGDKKLPVELVSYDSDKD
YAYIRFPVSNGTREVKIVSSIEYGENIHEDYDYTLMVFAQPITNNPDDYVDEETYNLQKL
LAPYHKAKTLERQVYELEKLQEKLPEKYKAEYKKKLDQTRVELADQVKSAVTEFENVTPT
NDQLTDLQEAHFVVFESEENSESVMDGFVEHPFYTATLNGQKYVVMKTKDDSYWKDLIVE
GKRVTTVSKDPKNNSRTLIFPYIPDKAVYNAIVKVVVANIGYEGQYHVRIINQDINTKDD
DTSQNNTSEPLNVQTGQEGKVADTDVAENSSTATNPKDASDKADVIEPESDVVKDADNNI
DKDVQHDVDHLSDMSDNNHFDKYDLKEMDTQIAKDTDRNVDKDADNSVGMSSNVDTDKDS
NKNKDKVIQLNHIADKNNHTGKAAKLDVVKQNYNNTDKVTDKKTTEHLPSDIHKTVDKTV
KTKEKAGTPSKENKLSQSKMLPKTGETTSSQSWWGLYALLGMLALFIPKFRKESK
>G1421_STAAU8325, UNDEFINED PRODUCT 1383972:1384061 FORWARD MW:3459
MKIILLLFLIFGFIVVVTLKSEHQLTLFSI
LOCUS 4 (E103)
>G2652_STAAU8325, UNDEFINED PRODUCT 2537955:2540798 REVERSE MW:104512
LHLRENIIVKSNLRYGIRKHKLGAASVFLGTMIVVGMGQEKEAAASEQNNTTVEESGSSA
TESKASETQTTTNNVNTIDETQSYSATSTEQPSQSTQVTTEEAPKTVQAPKVETSRVDLP
SEKVADKETTGTQVDIAQPSNVSEIKPRMKRSTDVTAVAEKEVVEETKATGTDVTNKVEV
EEGSEIVGHKQDTNVVNPHNAERVTLKYKWKFGEGIKAGDYFDFTLSDNVETHGISTLRK
VPEIKSTDGQVMATGEIIGERKVRYTFKEYVQEKKDLTAELSLNLFIDPTTVTQKGNQNV
EVKLGETTVSKIFNIQYLGGVRDNWGVTANGRIDTLNKVDGKFSHFAYMKPNNQSLSSVT
VTGQVTKGNKPGVNNPTVKVYKHIGSDDLAESVYAKLDDVSKFEDVTDNMSLDFDTNGGY
SLNFNNLDQSKNYVIKYEGYYDSNASNLEFQTHLFGYYNYYYTSNLTWKNGVAFYSNNAQ
GDGKDKLKEPIIEHSTPIELEFKSEPPVEKHELTGTIEESNDSKPIDFEYHTAVEGAEGH

AEGTIETEEDSIHVDFEESTHENSKHHADVVEYEEDTNPGGGQVTTESNLVEFDEDSTKG
IVTGAVSDHTTIEDTKEYTTESNLIELVDELPEEHGQAQGPIEEITENNHHISHSGLGTE
NGHGNYGVIEEIEENSHVDIKSELGYEGGQNSGNQSFEEDTEEDKPKYEQGGNIVDIDFD
SVPQIHGQNNGNQSFEEDTEKDKPKYEQGGNIIDIDFDSVPHIHGFNKHTEIIEEDTNKD
KPNYQFGGHNSVDFEEDTLPQVSGHNEGQQTIEEDTTPPIVPPTPPTPEVPSEPETPTPP
TPEVPSEPETPTPPTPEVPTEPGKPIPPAKEEPKKPSKPVEQGKVVTPVIEINEKVKAVV
PTKKAQSKKSELPETGGEESTNNGMLFGGLFSILGLALLRRNKKNHKA

LOCUS 5 (L4)

>G0788_STAAU8325, UNDEFINED PRODUCT 779770:781077 FORWARD
MW:50070

DQQKAFYQVLH
LKGITEEQRNQYIKTLREHPERAQEVFSESLKDSKNPDRRVAQQNAFYNVLKNDNLTEQE
KNNYIAQIKENPDRSQQVWVESVQSSKAKERQNIENADKAIKDFQDNKAPHDKSAAYEAN
SKLPKDLRDKNNRFVEKVSIEKAIVRHDERVKSANDAISKLNEKDSIENRRLAQREVNKA
PMDVKEHLQKQLDALVAQKDAEKKVAPKVEAPQIQSPQIEKPKVESPKVEVPQIQSPKVE
VPQSKLLGYYQSLKDSFNYGYKYLTDTYKSYKEKYDTAKYYYNTYYKYKGAIDQTVLTVL
GSGSKSYIQPLKVDDKNGYLAKSYAQVRNYVTESINTGKVLYTFYQNPTLVKTAIKAQET
ASSIKNTLSNLLSFWK

>G0790_STAAU8325, UNDEFINED PRODUCT 781580:782542 FORWARD
MW:36381

MNLKLNRKKVISMIKNKILTATLAVGLIAPLANPFIEISKAENKIEDIGQGAEIIKRTQD
ITSKRLAITQNIQFDFVKDKKYNKDALVVKMQGFISSRTTYSDLKKYPYIKRMIWPFQYN
ISLKTKDSNVDLINYLPKNKIDSADVSQKLGYNIGGNFQSAPSIGGSGSFNYSKTISYNQ
KNYVTEVESQNSKGVKWGVKANSFVTPNGQVSAYDQYLFAQDPTGPAARDYFVPDNQLPP
LIQSGFNPSFITTLSHERGKGDKSEFEITYGRNMDATYAYVTRHRLAVDRKHDAFKNRNV
TVKYEVNWKTHEVKIKSITPK

>G0791_STAAU8325, UNDEFINED PRODUCT 783104:784057 FORWARD
MW:35954

VKLMLKNKILTTTLSVSLLAPLANPLLENAKAANDTEDIGKGSDIEIIKRTEDKTSNKWG
VTQNIQFDFVKDKKYNKDALILKMQGFISSRTTYYNYKKTNHVKAMRWPFQYNIGLKTND
KYVSLINYLPKNKIESTNVSQTLGYNIGGNFQSAPSLGGNGSFNYSKSISYT

LOCUS 6 (D1)

>G0659_STAAU8325, UNDEFINED PRODUCT 644649:646835 REVERSE
MW:79536

MSKFIEPSVEEIKLEKVYQDMGLSDQEYEKVCDILGRQPNFTETGIFSVMWSEHCSYKHS
KPFLKQFPTSGDHVLMGPGEGAGVVDIGDNQAVVFKVESHNHPSAIEPYQGAATGVGGII
RDIVSIGARPINLLNSLRFGELDNKQNQRLLKGVVKGIGGYGNCIGIPTTAGEIEFDERY
DGNPLVNAMCVGVINHDMIQKGTAKGVGNSVIYVGLKTGRDGIHGATFASEELTEESESK
RPSVQIGDPFVGKKLMEATLEAITFDELVGIQDMGAAGLTSSSSEMAAKGGSGLHLRLEQ
VPTREPGISPYEMMLSETQERMLLVVEKGTEQKFLDLFDKHELDSAVIGEVTDTNRFVLT
YDDEVYADIPVEPLADEAPVYILEGEEKDYNTSKNDYTHIDVKDTFFKLLKHPTIASKHY
LY

LOCUS 7 (D1)
>G2308_STAAU8325, UNDEFINED PRODUCT 2206377:2207831 REVERSE MW:54671
MTDIINKLQAFADANPQSIAVRHTTDELTYQQLMDESSKLAHRLQGSKKPMILFGHMSPY
MIVGMIGAIKAGCGYVPVDTSIPEDRIKMIINKVQPEFVFNTTDESFESLEGEVFTIEDI
KTSQDPVIFDSQIKDNDTVYTIFTSGSTGEPKGVQIEYASLVQFTEWMLELNKSGNEQQW
LNQAPFSFDLSVMAIYPCLASGGTLNLVDKNMINKPKLLNEMLTATPINIWVSTPSFMEM
CLLLPTLNEEQYGSLNEFFFCGEILPHRAAKALVNRFPSATIYNTYGPTEATVAVTSIQI
TQEILDQYPTLPVGVERPGARLSTTDEGELVIEGQSVSLGYLKNDQKTAEVFNFDDGIRT
YHTGDKAKFENGQWFIQGRIDFQIKLNGYRMELEEIETQLRQSEFVKEAIVVPVYKNDKV
IHLIGAIVPTTEVTDNAEMTKNIKNDLKSRLPEYMIPRKFEWMEQLPLTSNGKIDRKKIA
EVING
>G2309_STAAU8325, UNDEFINED PRODUCT 2207850:2208050 REVERSE MW:7893
MNGLYKGVFTKNFKRCNMKSKSKQPPNKYVEAFKPYLLTLLYLAIFITLYLIYGSGDTHN
NFIYNEF
>G2310_STAAU8325, UNDEFINED PRODUCT 2208050:2208157 REVERSE MW:4396
MMTTNYYVESIKLKLNFIMNIDIMNCKKQILKRILY
LOCUS 8 (D4)
>G1191_STAAU8325, UNDEFINED PRODUCT 1158690:1159313 FORWARD MW:24008
DPNIHQAVVQDDNPDFESGEITQELQKGYKLKDRVLRPSMVKVNQ
>G1192_STAAU8325, UNDEFINED PRODUCT 1159361:1161214 FORWARD MW:67451
MIKWRNFIMSKIIGIDLGTTNSCVTVLEGDEPKVIQNPEGSRTTPSVVAFKNGETQVGEV
AKRQAITNPNTVQSIKRHMGTDYKVDIEGKSYTPQEISAMILQNLKNTAESYLGEKVDKA
VITVPAYFNDAERQATKDAGKIAGLEVERIINEPTAAALAYGLDKTDKDEKVLVFDLGGG
TFDVSILELGDGVFEVLSTAGDNKLGGDDFDQVIIDYLVAEFKKENGVDLSQDKMALQRL
KDAAEKAKKDLSGVSQTQISLPFISAGENGPLHLEVNLTRSKFEELSDSLIRRTMEPTRQ
AMKDAGLTNSDIDEVILVGGS
LOCUS 9A (D22) AA SEQUENCE
>G0560_STAAU8325, UNDEFINED PRODUCT 529664:558268 FORWARD MW:1029886
DQNTIKQGVN
FTDADEAKRNAYTNAVTQAEQILNKAQGPNTSKDGVETALENVQRAKNELNGNQNVANAK
TTAKNALNNLTSINNAQKEALKSQIEGATTVAGVNQVSTTASELNTAMSNLQNGINDEAA
TKAALNGTQNLEKAKQHANTAIDGLSHLTNAQKEALKQLVQQSTTVAEAQGNEQKANNVD
AAMDKLRQSIADNATTKQNQNYTDASQNKKDAYNNAVTTAQGIIDQTTSPTLDPTVINQA
AGQVSTTKNALNGNENLEAAKQQASQSLGSLDNLNNAQKQTVTDQINGAHTVDEANQIKQ
NAQNLNTAMGNLKQAIADKDATKATVNFTDADQAKQQAYNTAVTNAENIISKANGGNATQ
AEVEQAIKQVNAAKQALNGNANVQHAKDEATALINSSNDLNQAQKDALKQQVQNATTVAG
VNNVKQTAQELNNAMTQLKQGIADKEQTKADGNFVNADPDKQNAYNQAVAKAEALISATP
DVVVTPSEITAALNKVTQAKNDLNGNTNLATAKQNVQHAIDQLPNLNQAQRDEYSKQITQ
ATLVPNVNAIQQAATTLNDAMTQLKQGIANKAQIKGSENYHDADTDKQTAYDNAVTKAEE
LLKQTTNPTMDPNTIQQALTKVNDTNQALNGNQKLADAKQDAKTTLGTLDHLNDAQKQAL

TTQVEQAPDIATVNNVKQNAQNLNNAMTNLNNALQDKTETLNSINFTDADQAKKDAYTNA
VSHAEGILSKANGSNASQTEVEQAMQRVNEAKQALNGNDNVQRAKDAAKQVITNANDLNQ
AMTQLKQGIADKDQTKANGNFVNADTDKQNAYNNAVAHAEQIISGTPNANVDPQQVAQAL
QQVNQAKGDLNGNHNLQVAKDNANTAIDQLPNLNQPQKTALKDQVSHAELVTGVNAIKQN
ADALNNAMGTLKQQIQANSQVPQSVDFTQADQDKQQAYNNAANQAQQIANGIPTPVLTPD
TVTQAVTTMNQAKDALNGDEKLAQAKQEALANLDTLRDLNQPQRDALRNQINQAQALATV
EQTKQNAQNVNTAMSNLKQGIANKDTVKASENYHDADADKQTAYTNAVSQAEGIINQTTN
PTLNPDEITRALTQVTDAKNGLNGEAKLATEKQNAKDAVSGMTHLNDAQKQALKGQIDQS
PEIATVNQVKQTATSLDQAMDQLSQAINDKAQTLADGNYLNADPDKQNAYKQAVAKAEAL
LNKQSGTNEVQAQVESITNEVNAAKQALNGNDNLANAKQQAKQQLANLTHLNDAQKQSFE
SQITQAPLVTDVTTINQKAQ
LOCUS 9B (I2) AA SEQUENCE
>G0558_STAAU8325, UNDEFINED PRODUCT 527809:529263 FORWARD MW:51904
SFSLFIVLEKRATNPLIDFKLFKNKAYTGATASNFL
LNGVAGTLIVANTFVQRGLGYSSLQAGSLSITYLVMVLIMIRVGEKLLQTLGCKKPMLIG
TGVLIVGECLISLTFLPEIFYVICCIIGYLFFGLGLGIYATPSTDTAIANAPLEKVGVAA
GIYKMASALGGAFGVALSGAVYAIVSNMTNIYTGAMIALWLNAGMGILSFVIILLLVPKQ
NDTQL
>G0560_STAAU8325, UNDEFINED PRODUCT 529664:558268 FORWARD MW:1029886
MNYRDKIQKFSIRKYTVGTFSTVIATLVFLGFNTSQAHAAETNQPASVVKQKQQSNNEQT
ENRESQVQNSQNSQNGQSLSATHENEQPNISQANLVDQKVAQSSTTNDEQPASQNVNTKK
DSATAATTQPDKEQSKHKQNESQSANKNGNDNRAAHVENHEANVVTASDSSDNGNVQHDR
NELQAFFDANYHDYRFIDRENADSGTFNYVKGIFDKINTLLGSND
LOCUS 9C (J13) AA SEQUENCE
>G0560_STAAU8325, UNDEFINED PRODUCT 529664:558268 FORWARD MW:1029886
DQEKRQAYDSKVTNAENIISGTPNATLTVNDV
NSAASQVNAAKTALNGDNNLRVAKEHANNTIDGLAQLNNAQKAKLKEQVQSATTLDGVQT
VKNSSQTLNTAMKGLRDSIANEATIKAGQNYTDASPNNRNEYDSAVTAAKAIINQTSNPT
MEPNTITQVTSQVTTKEQALNGARNLAQAKTTAKNNLNNLTSINNAQKDALTRSIDGATT
VAGVNQETAKATELNNAMHSLQNGINDETQTKQTQKYLDAEPSKKSAYDQAVNAAKAILT
KASGQNVDKAAVEQALQNVNSTKTALNGDAKLNEAKAAAKQTLGTLTHINNAQRTALDNE
ITQATNVEGVNTVKAKAQQLDGAMGQLETSIRDKDTTLQSQNYQDADDAKRTAYSQAVNA
AATILNKTAGGNTPKADVERAMQAVTQANTALNGIQNLDRAKQAANTAITNASDLNTKQK
EALKAQVTSAGRVSAANGVEHTATELNTAMTALKRAIADKAETKASGNYVNADANKRQAY
DEKVTAAENIVSGTPTPTLTPADVTNAATQVTNAKTQLNGNHNLEVAKQNANTAIDGLTS
LNGPQKAKLKEQVGQATTLPNVQTVRDNAQTLNTAMKGLRDSIANEATIKAGQNYTDASQ
NKQTDYNSAVTAAKAIIGQTTSPSMNAQEINQAKDQVTAKQQALNGQENLRTAQTNAKQH
LNGLSDLTDAQKDAVKRQIEGATHVNEVTQAQNNADALNTAMTNLKNGIQDQNTIKQGVN
FTDADE
LOCUS 9D (M11) AA SEQUENCE
>G0560_STAAU8325, UNDEFINED PRODUCT 529664:558268 FORWARD MW:1029886
SQAINDKAQTLADGNYLNADPDKQNAYKQAVAKAEAL
LNKQSGTNEVQAQVESITNEVNAAKQALNGNDNLANAKQQAKQQLANLTHLNDAQKQSFE
SQITQAPLVTDVTTINQKAQTLDHAMELLRNSVADNQTTLASEDYHDATAQRQNDYNQAV

TAANNIINQTTSPTMNPDDVNGATTQVNNTKVALDGDENLAAAKQQANNRLDQLDHLNNA
QKQQLQSQITQSSDIAAVNGHKQTAESLNTAMGNLINAIADHQAVEQRGNFINADTDKQT
AYNTAVNEAAAMINKQTGQNANQTEVEQAITKVQTTLQALNGDHNLQVAKTNATQAIDAL
TSLNDPQKTALKDQVTAATLVTAVHQIEQNANTLNQAMHGLRQSIQDNAATKANSKYINE
DQPEQQNYDQAVQAANNIINEQTATLDNNAINQAATTVNTTKAALHGDVKLQNDKDHAKQ
TVSQLAHLNNAQKHMEDTLIDSETTRTAVKQDLTEAQALDQLMDALQQSIADKDATRASS
AYVNAEPNKKQSYDEAVQNAESIIAGLNNPTINKGNVSSATQAVISSKNALDGVERLAQD
KQTAGNSLNHLDQLTPAQQQALENQINNATTRDKVAEIIAQAQALNEAMKALKESIKDQP
QTEASSKFINEDQAQKDAYTQAVQHAKDLINKTTDPTLAKSIIDQATQAVTDAKNNLHGD
QKLAQDKQRATETLNNLSNLNTPQRQALENQINNAATRGEVAQKLTEAQALNQAMEALRN
SIQDQQQTEAGSKFINEDKPQKDAYQAAVQNAKDLINQTNNPTLDKAQVEQLTQAVNQAK
DNLHGDQKLADDKQHAVTDLNQLNGLNNPQRQALESQINNAATRGEVAQKLAEAKALDQA
MQALRNSIQDQQQTESGSKFINEDKPQKDAYQAAVQNAKDLINQTGNPTLDKSQVEQLTQ
AVTTAKDNLHGDQKLARDQQQAVTTVNALPNLNHAQQQALTDAINAAPTRTEVAQHVQTA
TELDHAMETLKNKVDQVNTDKAQPNYTEASTDKKEAVDQALQAAESITDPTNGSNANKDA
VDQVLTKLQEKENELNGNERVAEAKTQAKQTIDQLTHLNADQIATAKQNI
LOCUS 9E (M13) AA SEQUENCE
>G0560_STAAU8325, UNDEFINED PRODUCT 529664:558268 FORWARD MW:1029886
DRVLASHPDVATIRQNVTAANAAKSALDQARNGLTVD
KAPLENAKNQLQHSIDTQTSTTGMTQDSINAYNAKLTAARNKIQQINQVLAGSPTVEQIN
TNTSTANQAKSDLDHARQALTPDKAPLQTAKTQLEQSINQPTDTTGMTTASLNAYNQKLQ
AARQKLTEINQVLNGNPTVQNINDKVTEANQAKDQLNTARQGLTLDRQPALTTLHGASNL
NQAQQNNFTQQINAAQNHAALETIKSNITALNTAMTKLKDSVADNNTIKSDQNYTDATPA
NKQAYDNAVNAAKGVIGETTNPTMDVNTVNQKAASVKSTKDALDGQQNLQRAKTEATNAI
THASDLNQAQKNALTQQVNSAQNVQAVNDIKQTTQSLNTAMTGLKRGVANHNQVVQSDNY
VNADTNKKNDYNNAYNHANDIINGNAQHPVITPSDVNNALSNVTSKEHALNGEAKLNAAK
QEANTALGHLNNLNNAQRQNLQSQINGAHQIDAVNTIKQNATNLNSAMGNLRQAVADKDQ
VKRTEDYADADTAKQNAYNSAVSSAETIINQTTNPTMSVDDVNRATSAVTSNKNALNGYE
KLAQSKTDAARAIDALPHLNNAQKADVKSKINAASNIAGVNTVKQQGTDLNTAMGNLQGA
INDEQTTLNSQNYQDATPSKKTAYTNAVQAAKDILNKSNGQNKTKDQVTEAMNQVNSAKN
NLDGTRLLD
LOCUS 10 (D9)
>G2169_STAAU8325, UNDEFINED PRODUCT 2045731:2047263 FORWARD MW:55179
MLMKSLFEKAQQFGKSFMLPIAILPAAGLLLGIGGALSNPNTVKAYPILDITLLQNIFTL
MSAAGSIVFQNLPVIFAIGVAIGLSRSDKGTAGLAALLGFLIMNATMNGLLTITGTLAK
>G2167_STAAU8325, UNDEFINED PRODUCT 2044443:2045375 REVERSE MW:33794
MKRKIIMDCDPGHDDAIALILAGAIDSPLEILAVTTVAGNQSVDKNTTNALNVLDIMGRQ
DIAVAKGADRPLIKPAAFASEIHGESGLDGPKLPSTPSRQAVAMPASDVIINKVMTSDTP
VTIVATGPLTNVATALIREPRIAEHIESITLMGGGTFGNWTPTAEFNIWVDAEAAKRVFE
SGITINVFGLDVTHQVLAD
LOCUS 11 (D10)
>G2285_STAAU8325, UNDEFINED PRODUCT 2183380:2183499 REVERSE

MW:4917
MHQLKALLVLTHPRYYKTSQKHHYLIYLNKNSQSYLILFL
>G2286_STAAU8325, UNDEFINED PRODUCT 2183646:2184428 REVERSE MW:27575
MIFMTNNKVALVTGGAQGIGFKIAERLVEDGFKVAVVDFNEEGAKAAALKLSSDGTKAIA
IKADVSNRDDVFNAVRQTAAQFGDFHVMVNNAGLGPTTPIDTITEEQFKTVYGVNVAGVL
WGIQAAHEQFKKFNHGGKIINATSQAGVEGNPGLSLYCSTKFAVRGLTQVAAQDLASEGI
TVNAFAPGIVQTPMMESIAVATAEEAGKPEAWGWEQFTSQIALGRVSQPEDVSNVVSFLA
GKDSDYITGQTIIVDGGMRFR
>G2287_STAAU8325, UNDEFINED PRODUCT 2184634:2185257 REVERSE MW:22980
MEKNVEKSFIKIGLYFQIAYIVLMAITLCGFVICYGLIFGLFYLLSGSRADYLIVTIVIS
AIISIFVIILSIVPVIVLASDLFKERISKGVILIVLAIIALVLCNFVSAILWFVSAISIL
GRKKLVAAADTTTIQKSKGNANQASHKDTCKKELDSQDMMEHPEVKNPTTKNLEGFNEEI
HKDEATTKVVSDNTEPPIESKDHVSKKD
LOCUS 12 ()
>G1787_STAAU8325, UNDEFINED PRODUCT 1678934:1683439 REVERSE MW:166665
RGGVGADG
ITGDGAGIMTEIPFAFFKQHVTDFDIPGEGEYAVGLFFSKERILGSEHEVVFKKYFEGEG
LSILGYRNVPVNKDAIAKHVADTMPVIQQVFIDIRDIEDVEKRLFLARKQLEFYSTQCDL
ELYFTSLSRKTIVYKGWLRSDQIKKLYTDLSDDLYQSKLGLVHSRFSTNTFPSWKRAHPN
RMLMHNGEINTIKGNVNWMRARQHKLIETLFGEDQHKVFQIVDEDGSDSAIVDNALEFLS
LAMEPEKAAMLLIPEPWLYNEANDANVRAFYEFYSYLMEPWDGPTMISFCNGDKLGALTD
RNGLRPGRYTITKDNFIVFSSEVGVVDVPESNVAFKGQLNPGKLLLVDFKQNKVIENNDL
KGAIAGELPYKAWIDNHKVDFDFENIQYQDSQWKDETLFKLQRQFAYTKEEIHKYIQELV
EGKKDPIGAMGYDAPIAVLNERPESLFNYFKQLFAQVTNPPIDAYREKIVTSELSYLGGE
GNLLAPDETVLDRIQLKRPVLNESHLAAIDQEHFKLTYLSTVYEGDLEDALEALGREAVN
AVKQGAQILVLDDSGLVDSNGFAMPMLLAISHVHQLLIKADLRMSTSLVAKSGETREVHH
VACLLAYGANAIVPYLAQRTVEQLTLTEGLQGTVVDNVKTYTDVLSEGVIKVMAKMGIST
VQSYQGAQIFEAIGLSHDVIDRYFTGTQSKLSGISIDQIDAENKARQQSDDNYLASGSTF
QWRQQGQHHAFNPESIFLLQHACKENDYAQFKAYSEAVNKNRTDHIRHLLEFKACTPIDI
DQVEPVSDIVKRFNTGAMSYGSISAEAHETLAQAMNQLGGKSNSGEGGEDAKRYEVQVDG
SNKVSAIKQVASGRFGVTSDYLQHAKEIQIKVAQGAKPGEGGQLPGTKVYPWIAKTRGST
PGIGLISPPPHHDIYSIEDLAQLIHDLKNANKDADIAVKLVSKTGVGTIASGVAKAFADK
IVISGYDGGTGASPKTSIQHAGVPWEIGLAETHQTLKLNDLRSRVKLETDGKLLTGKDVA
YACALGAEEFGFATAPLVVLGCIMMRVCHKDTCPVGVATQNKDLRALYRGKAHHVVNFMH
FIAQELREILASLGLKRVEDLVGRTDLLQRSSTLKANSKAASIDVEKLLCPFDGPNTKEI
QQNHNLEHGFDLTNLYEVTKPYIAEGRRYTGSFTVNNEQRDVGVITGSEISKQYGEAGLP
ENTINVYTNGHAGQSLAAYAPKGLMIHHTGDANDYVGKGLSGGTVIVKAPFEERQNEIIA
GNVSFYGATSGKAFINGSAGERFCIRNSGVDVVVEGIGDHGLEYMTGGHVINLGDVGKNF
GQGMSGGIAYVIPSDVEAFVENNQLDTLSFTKIKHQEEKAFIKQMLEEHVSHTNSTRAIH
VLKHFDRIEDVVVKVIPKDYQLMMQKIHLHKSLHDNEDEAMLAAFYDDSKTIDAKHKPAV
VY
LOCUS 13 (D18)
>G1977_STAAU8325, UNDEFINED PRODUCT 1846179:1847864 REVERSE

MW:62494
MRVIMEIILFLTMMVMITYVFSGYLYRVALVQSSRVDLIFTRFENMCFKIIGTDLEHMSA
KTYVKHFLAFNGFMGFITFVLLIVQQWLFLNPNHNLNQSIDLAFNTAISFLTNSNLQHYN
GESDVTYLTQMIVMTYLMFTSSASGYAVCIAMLRRLTGLTNIIGNFYQDIVRFIVRVLLP
LSCLISILLMTQGVPQTLHANLMIRTLSGHIQHIAFGPIASLESIKHLGTNGGGFLAGNS
ATPFENPNIWSNFIEMGSMMLLPMSMLFLFGRMLSRHGKRVHRHALILFVAMFFIFIAIL
TLTMWSEYRGNPILANLGIYGPNMEGKEVRFGAGLSALFTVITTAFTTGSVNNMHDSLTP
IGGLGPMVLMMLNVVFGGEGVGLMNLLIFVLLTVFICSLMVGKTPEYLNMPIGAREMKCI
VLVFLIHPILILVFSALAFMIPGASESITNPSFHGISQVMYEMTSAAANNGS
LOCUS 14 (D21)
>G2377_STAAU8325, UNDEFINED PRODUCT 2262585:2263772 REVERSE MW:42602
DPELGKYWASLGDVFVNDAFGTAHREHASNVGISTHLETAAGFLMDKEI
KFIGGVVNDPHKPVVAILGGAKVSDKINVIKNLVNIADKIIIGGGMAYTFLKAQGKEIGI
SLLEEDKIDFAKDLLEKHGDKIVLPVDTKVAKEFSNDAKITVVPSDSIPADQEGMDIGPN
TVKLFADELEGAHTVVWNGPMGVFEFSNFAQGTIGVCKAIANLKDAITIIGGGDSAAAAI
SLGFENDFTHISTGGGASLEYLEGKELPGIKAINNK
>G2375_STAAU8325, UNDEFINED PRODUCT 2261702:2262559 REVERSE MW:30982
MACLFNIVTGKQSQDDIVFHHFSKIFTKQGVSLMRTPIIAGNWKMNKTVQEAKDFVNTLP
TLPDSKEVESVICAPAIQLDALTTAVKEGKAQGLEIGAQNTYFEDNGAFTGETSPVALAD
LGVKYVVIGHSERRELFHETDEEINKKAHAIFKHGMTPIICVGETDEERESGKANDVVGE
QVKKAVAGLSEDQLKSVVIAYEPIWAIGTGKSSTSEDANEMCAFVRQTIADLSSKEVSEA
TRIQYGGSVKPNNIKEYMAQTDIDGALVGGASLKVEDFVQLLEGAK
>G2374_STAAU8325, UNDEFINED PRODUCT 2260182:2261696 REVERSE MW:56424
MAKKPTALIILDGFANRESEHGNAVKLANKPNFDRYYNKYPTTQIEASGLDVGLPEGQMG
NSEVGHMNIGAGRIVYQSLTRINKSIEDGDFFENDVLNNAIAHVNSHDSALHIFGLLSDG
GVHSHYKHLFALLELAKKQGVEKVYVHAFLDGRDVDQKSALKYIEETEAKFNELGIGQFA
SVSGRYYAMDRDKRWEREEKAYNAIRNFDAPTYATAKEGVEASYNEGLTDEFVVPFIVEN
QNDGVNDGDAVI
LOCUS 15 (I1)
>G2097_STAAU8325, UNDEFINED PRODUCT 1973418:1974263 REVERSE MW:31442
VDLNDRLTFHKRKDRKIVVEIEHNYVP
SNHKNLAYRAAQLFIEQYQLKQGVTISIDKEIPVSAGLAGGSADAAATLRGLNRLFDIGA
SLEELALLGSKIGTDIPFCIYNKTALCTGRGEKIEFLNKPPSAWVILAKPNLGISSPDIF
KLINLDKRYDVHTKMCYEALENRDYQQLCQSLSNRLEPISVSKHPQIDKLKNNMLKSGAD
GALMSGSGPTVYGLARKESQAKNIYNAVNGCCNEVYLVRLLG
>G2096_STAAU8325, UNDEFINED PRODUCT 1972580:1973401 REVERSE MW:30395
MRYKRSERIVFMTQYLMNHPNKLIPLTFFVKKFKQAKSSISEDVQIIKNTFQKEKLGTVI
TTAGASGGVTYKPMMSKEEATEVVNEVITLLEEKERLLPGGYLFLSDLVGNPSLLNKVGK
LIASIYMEEKLDAVVTIATKGISLANAVANILNLPVVVIRKDNKVTEGSTVSINYVSGS

LOCUS 17 (I3)
>G1894_STAAU8325, UNDEFINED PRODUCT 1776805:1778031 REVERSE MW:45559
DRTALEEQEATFGRKRHSGAPLTGGKEF
DEIDLKAKDSHGEYIIDKDAHTRLAKEANTSILRRAFNYVDGTDDRTGNFETGLLFIAFQ
KATKQFIDIQNNLGSNDKLNEYITHRGSASFLVLPGVSKGGYLGETLFD
>G1893_STAAU8325, UNDEFINED PRODUCT 1775112:1776845 REVERSE MW:64202
MLVREDTLVKHYLTKFVAMLITAAMVCSFGLLKSQAAEQQSISDVYSVITDAKSALSNNS
ISNDNKQKAIEQVVSAVKKLSLEDNSESNAVKSDVRKLEDAKANDNQKDTLSQLTKSLIA
YEEKLASKDAGSKIKLLQQQVDAKDAAMTKAIKDKNKAELESLNNSLNQIWTSNETVIRN
YDANQYGQIEVALLQLRIAIHKSPLDTAKVSHAWTTFKSNIDHVDKKSNTSANDQYHVSQ
LNDALEKAIKAIDDNQLSDADAALTHFIETWPYVEGQIQTKDGALYTKIEDKIPYYQSVL
DEHNKAHVKDGLVDLNNQIKEVVGHSYSFVDVMIIFLREGLEVLLIVMTLTTMTRNVKDK
KGTASVIGGAIAGLVLSIILAITFVETLGNSGILRESMEAGLGIVAVILMFIVGVWMHKR
SNAKRWNDMIKNMYANAISNGNLVLLATIGLISVLREGVEVIIFYMGMIGELATKDFIIG
IALAIVILIIFALLFRFIVKLIPIFYIFRVLSI
LOCUS 18 (I5)
>G2386_STAAU8325, UNDEFINED PRODUCT 2274220:2275152 REVERSE MW:33616
MTEIDFDIAIIGAGPAGMTAAVYASRANLKTVMIERGIPGGQMANTEEVENFPGFEMITG
PDLSTKMFEHAKKFGAVYQYGDIKSVEDKGEYKVINFGNKELTAKAVIIATGAEYKKIGV
PGEQELGGRGVSYCAVCDGAFFKNKRLFVIGGGDSAVEEGTFLTKFADKVTIVHRRDELR
AQRILQDRAFKNDKIDFIWSHTLKSINEKDGKVGSVTLTSTKDGSEETHEADGVFIYIGM
KPLTAPFKDLGITNDVGYIVTKDDMTTSVPGIFAAGDVRDKGLRQIVTATGDGSIAAQSA
AEYIEHLND
>G2387_STAAU8325, UNDEFINED PRODUCT 2275222:2276658 REVERSE MW:57062
HYRLYGIFLLDQLNGKEIVM
TESIWQVLENLNNYEKLYLTYLVQGLTLNKLDFIHRGLLTLYHNELFVSENDVMVAWINQ
GELIIAEKVDLTDVEPYIGAFIYLYFKNQPRNVTKKQITTWLGITQYKLNKMIEFLLSI
LOCUS 19 (I8)
>G2296_STAAU8325, UNDEFINED PRODUCT 2195143:2196150 REVERSE MW:37749
DDEIILLNPMGMAIEDISSAYFIYQQAQQQNIGTTLNLY
>G2295_STAAU8325, UNDEFINED PRODUCT 2193368:2195119 REVERSE MW:66415
MQNHTAVNTAQAIILRDLVDALLFEDIAGIVSNSEITKENGQTLLIYERETQQIKIPVYF
SALNMFRYESSQPITIEGRVSKQPLTAAEFWQTIANMNCDLSHEWEVARVEEGLTTAATQ
LAKQLSELDLASHPFVMSEQFASLKDRPFHPLAKEKRGLREADYQVYQAELNQSFPLMVA
AVKKTHMIHGDTANIDELENLTVPIKEQATDMLNDQGLSIDDYVLFPVHPWQYQHILPNV
FAKEISEKLVVLLPLKFGDYLSSSSMRSLIDIGAPYNHVKVPFAMQSLGALRLTPTRYMK
NGEQAEQLLRQLIEKDEALAKYVMVCDETAWWSYMGQDNDIFKDQLGHLTVQLRKYPEVL
AKNDTQQLVSMAALAANDRTLYQMICGKDNISKNDVMTLFEDIAQVFLKVTLSFMQYGAL

PELHGQNILLSFEDGRVQKCVLRDHDTVRIYKPWLTAHQLSLPKYVVREDTPNTLINEDL
ETFFAYFQTLAVSVNLYAIIDAIQDLFGVSEHELMSLLKQILKNEVATISWVTTDQLAVR
HILFDKQTWPFKQILLPLLYQRDSGGGSMPSGLTTVPNPMVTYD
>G2294_STAAU8325, UNDEFINED PRODUCT 2192119:2193372 REVERSE MW:44835
MINQSIWRSNFRILWLSQFIAIAGLTVLVPLLPIYMASLQNLSVVEIQLWSGIAIAAPAV
TTMIASPIWGKLGDKISRKWMVLRALLGLAVCLFLMALCTTPLQFVLVRLLQGLFGGVVD
ASSAFASAEAPAEDRGKVLGRLQSSVSAGSLVGPLIGGVTASILGFSALLMSIAVITFIV
CIFGALKLIETTHMPKSQTPNINKGIRRSFQCLLCTQQTCRFIIVGVLANFAMYGMLTAL
SPLASSVNHTAIDDRSVIGFLQSAFWTASILSAPLWGRFNDKSYVKSVYIFATIACGCSA
ILQGLATNIEFLMAARILQGLTYSALIQSVMFVVVNACHQQLKGTFVGTTNSMLVVGQII
GSLSGAAITSYTTPATTFIVMGVVFAVSSLFLICSTITNQIND
LOCUS 20 (J7/M10)
>G2187_STAAU8325, UNDEFINED PRODUCT 2068723:2070984 REVERSE MW:85428
LPDNFKTYCAKMSIKTSSIQYENDDIMRESYGDDYGIACCV
SAMTIGKQMQFFGARANLAKTLLYAINGGKDEKSGAQVGPNFEGINSEVLEYDEVFKKFD
QMMDWLAGVYINSLNVIHYMHDKYSYERIEMALHDTEIVRTMATGIAGLSVAADSLSAIK
YAQVKPIRNEEGLVVDFEIEGDFPKYGNNDDRVDDIAVDLVERFMTKLRSHKTYRDSEHT
MSVLTITSNVVYGKKTGNTPDGRKAGEPFAPGANPMHGRDQKGALSSLSSVAKIPYDCCK
DGISNTFSIVPKSLGKEPEDQNRNLTSMLDGYAMQCGHHLNINVFNRETLIDAMEHPEEY
PQLTIRVSGYAVNFIKLTREQQLDVISRTFHESM
>G2186_STAAU8325, UNDEFINED PRODUCT 2067945:2068697 REVERSE MW:28498
MLKGHLHSVESLGTVDGPGLRYILFTQGCLLRCLYCHNPDTWKISEPSREVTVDEMVNEI
LPYKPYFDASGGGVTVSGGEPLLQMPFLEKLFAELKENGVHTCLDTSAGCANDTKAFQRH
FEELQKHTDLILLDIKHIDNDKHIRLTGKPNTHILNFARKLSDMKQPVWIRHVLVPGYSD
DKDDLIKLGEFINSLDNVEKFEILPYHQLGVHKWKTLGIAYELEDVEAPDDEAVKAAYRY
VNFKGKIPVEL
>G2185_STAAU8325, UNDEFINED PRODUCT 2065846:2067657 REVERSE MW:69718
MKNIKMKLNIKAMRSVIMKRISKDIWAVFKLLYQNKGRFSINALLLQLIMIFISSTYLIL
LFNMMLKVAGQSQLTINNWTEIVSHPASVILLIIFILSVAFLIYVEFSLLVYMVYAGFDR
QIITFKSIFKNAFVNVRKLIGVPVIFFVIYLMLMIPIANLGLSSVLTKNIYIPKFLTEEL
MKTTKGIIIYGTFMIAVFILNFKLIFTLPLTILNRQSLFKNMRLSWQITKRNKFRLVIEI
VILELIIGAILTLIISGATYLAICVDEEGDKFLVSSILFVVLKSALFFYYLFTKLSLISV
LVLHLKQENVLDQPGLEFKYPKPKRKSRFFIISMVLAVTCFIGYNMYLLYNNTINTNISI
IGHRGFEDKGVENSIPSLKAAAKANVEYVELDTIMTKDKQFVVSHDNNLKRLTGVNKNIS
ESNFKDIVGLKMRQNGHEAKFVSLDEFIETAKQSNVKLLVELKPHGKEPADYTQRVIDIL
KKHGVEHQYRVMSLDYDVMTKLKKEAPYLKCGYIIPLQFGHFKETSLDFFVIEDFSYSPR
LVNQAHLENKEVYTWTINGEEDLTKYLQTNVDGIITDDPALADQIKEEKKDETYFDRSIR
ILFE
>G2184_STAAU8325, UNDEFINED PRODUCT 2065335:2065676 FORWARD MW:12828
MTTQMKIKTYLVAGIKAALLDTTGIKLASKSETTSHTYQHQALVDQLHELIANTDLNKLS
YLNLDAFQKRDILAAHYIAKSAIRTKNLDQMTKAKQRLESIYNSISNPLHSQNN
>G2183_STAAU8325, UNDEFINED PRODUCT 2063238:2065145 REVERSE MW:71718

MKKQIISLGALAVASSLFTWDNKADAIVTKDYSGKSQVNAGSKNGTLIDSRYLNSALYYL
EDYIIYAIGLTNKYEYGDNIYKEAKDRLLEKVLREDQYLLERKKSQYEDYKQWYANYKKE
NPRTDLKMANFHKYNLEELSMKEYNELQDALKRALDDFHREVKDIKDKNSDLKTFNAAEE
DKATKEVYDLVSEIDTLVVSYYGDKDYGEHAKELRAKLDLILGDTDNPHKITNERIKKEM
IDDLNSIIDDFFMETKQNRPKSITKYNPTTHNYKTNSDNKPNFDKLVEETKKAVKEADDS
WKKKTVKKYGETETKSPVVKEEKKVEEPQAPKVDNQQEVKTTAGKAEETTQPVAQPLVKI
PQGTITGEIVKGPEYPTMENKTVQGEIVQGPDFLTMEQSGPSLSNNYTNPPLTNPILEGL
EGSSSKLEIKPQGTESTLKGTQGESSDIEVKPQATETTEASQYGPRPQFNKTPKYVKYRD
AGTGIREYNDGTFGYEARPRFNKPSETNAYNVTTHANGQVSYGARPTYKKPSETNAYNVT
THANGQVSYGARPTQNKPSKTNAYNVTTHGNGQVSYGARPTQNKPSKTNAYNVTTHANGQ
VSYGARPTYKKPSKTNAYNVTTHADGTATYGPRVTK
>G2182_STAAU8325, UNDEFINED PRODUCT 2062946:2063050 FORWARD MW:3842
MCVRTRLVSSSSARLSKAIIIAVIVVYHLDVRGLF
>G2181_STAAU8325, UNDEFINED PRODUCT 2061438:2062628 FORWARD MW:42182
MITMQEAYIVAYGRSAAAKAKQGALFHERPDDVAAKVLQGVLKRIDGKFNKNMIEDVIVG
TAFPEGLQGQNIARTIALRAGLSDTVPGQTVNRYCSSGLQTIAIAANQIMAGQGDILVAG
GVELMSAVPMGGNEPTNNPTLQYDDIGASYPMGLTAENVASQFDVSREDQDAYAVRSHQR
AYDAQRDGRFKDEIIPIQVNSVEYTNAGPKVHTNIFDQDEFIRPDTTMEALAKLRTVFKA
DGTMTAGTSAPLSDGAGFVVLMSGDKVKELGVTPIARFVGFKAVGVDPKIMGIGPAYAIP
EVLSLSNLSVEDIDLIELNEAFASQTIASIKEVGLDISRTNVNGGAIALGHPLGATGAML
TARLLNEMGRRPDSRYGMVTMCIGVGMGAAAIFEYVR
>G2180_STAAU8325, UNDEFINED PRODUCT 2059156:2061414 FORWARD MW:84609
MTINKVTVLGAGTMGAQLAALFVNAGLKVKLLDIVVDKNDPNLIAKKSYDKITDKKRPLL
FDLNLASHLTYGNFDDDLVNDDADLYIEAVKEDIEIKHAVWQQVLQHAKEDALFATNTSG
IPINAIAQAFNEKDQERFFGLHFFNPPRIMKLVELIPTSHTKESIILDVKNFAQNVLGKG
VIVVNDVPGFVANRVGTQTMNDIMYRAEQHKISIVDVDALTGQAIGRPKTGTYALSDLVG
LDIAVSVIKGMQQVPEETPYFHDVKIVNTLFDNGALGRKTKQGFYKKDKETKARLVYDVE
KQDYVPVSQPQLPILNEFNKDLVHNLDTIFNAQDEAGLFLWETLRNNFYYSAINVPKATD
DFRDIDRALVWGFNWKLGPFQLWDAMGYERVKTRMEDELGDLPQWISDLDGGFYKQDETI
EYATPISHFVKDELWDKGDAKLSVTHDDQLLLKLQSKNNVITDEFNDALVDAIDLLENDH
YTSMVIYADGNNFSVGANLFLMKKAHEDGLVDDVVAQSIDKLHYSFNRLKYSLKPVVTAV
QGRALGGGCELVLYSPIVVAASETYIGLVEAGVGLLPSGGGLAEMADRILRTSHKFDDKQ
ASMTKVLTNIAFAKVSTNAFEARRYGYLRDTDTIIFNTAQRVEVALKRAKYEAETNYIPN
PRHQYIALGEDFKALIQGQLDAQRRGHFISDHDYHIALNIATILAGGDLPRNTFINQRYI
QSLEKIGFIDLLKSKKSYERIAHMLKTGKPLRN
>G2179_STAAU8325, UNDEFINED PRODUCT 2057714:2058967 FORWARD MW:46482
MHFTLVFILFLGGIYMTFEKETVLKTLFPEDVLSIAKGLTDGEVEFLQQVDSLLESKYRE
NINQHWIDATVPEDYFKDLGELNYFNNPLLYKDRPNAKMPSQLFQFFMSYLLARFDISLA
TLLGVHQGLGHNTFYFGGSKEQIAKYVPKLQSHELRTCFALTEPEHGSDVAGGLETVAER
QGDTWVINGEKKWIGGAHVSDVIPVFAVNKETGKPHCFVVRPEQDGVDIEVIDNKIALRI
VPNALIKLTNVKVDEADRLQNITSFKDIAKILYSTRAGVAYMATGGMAGALRATLDYVTE
RKQFGKPISKYQLIQEKLAMMQGNLAQAMATCAQLANMQAHGEYDEVATSTAKMMNALRL
RETVAMGRGITGGNGILADDYDIARFFSDAEAIYTYEGTHEINALVIGRALTGDSAFV

LOCUS 21 (G3)
G1927FRG
MNILFAITGIAFALFVAFLF
>G1928_STAAU8325, UNDEFINED PRODUCT 1810990:1811910 REVERSE MW:32866
MANLQKYIEYSREVQQARENNQPIVALESTIISHGMPYPQNVEMATTVEQIIRNNGAIPA
TIAIIDGKIKIGLESEDLEILATSKDVAKVSRRDLAEVIAMKCVGATTVATTMICAAMAG
IQFFVTGGIGGVHKGAEHTMDISADLEELSKTNVTVICAGAKSILDLPKTMEYLETKGVP
VIGYQTNELPAFFTRESGVKLTSSVETPERLADIHLTKQQLNLEGGIVVANPIPYEHALS
KAYIEAIINEAVVEAENQGIKGKDATPFLLGKIVEKTNGKSLAANIKLVENNAALGAKIA
VAVNKLL
G1929
LDHVQQFENASTGSYTALISKEGDMTYGLADMEVFDYITPE
FLIKRSHLLKKAKCIIVDLNLGKEALNFLCAYTTKHQIKLVITTVSSPKMKNMPDSLHAI
DWIITNKDETETYLNLKIESTDDLKIAAKRWNDLGVKNVIVTNGVKELIYRSGEEEIIKS
VMPSNSVKDVTGAGDSFCAAVVYSWLNGMSTEDILIAGMVNAKKTIETKYTVRQNLDQQQ
LYHDMEDYKNGKFTKVY
LOCUS 22 (I19)
>G0974 FRG_STAAU8325, UNDEFINED PRODUCT 974673:975977 REVERSE MW:47346
VNEMVNEQIIDISGPLKGEIEVPGDKSMTHRAIMLASLAEGVSTIYKPLLGEDCRRTMDI
FRLLGVEIKEDDEKLVVTSPGYQSFNTPHQVLYTGNSGTTTRLLAGLLSGLGIESVLSGD
VSIGKRPMD
>G0975_STAAU8325, UNDEFINED PRODUCT 975981:977042 REVERSE MW:40300
MKLQTTYPSNNYPIYVEHGAIDHISTYIDQFDQSFILIDEHVNQYFADKFDDILSYENVH
KVIIPAGEKTKTFEQYQETLEYILSHHVTRNTAIIAVGGGATGDFAGFIAATLLRGVHFI
QVPTTILAHDSSVGGKVGINSKQGKNLIGAFYRPTAVIYDLVFLKTLPFEQILSGYAEVY
KHALLNGESATQDIEQHFKDREILQSLNGMDKYIAKGIETKLDIVIADEKEQGVRKFLNL
GHTFGHAVEYYHKIPHGHAVMVGIIYQFIVANALFDSKHDINHYIQYLIQLGYPLDMITD
LDFETLYQYMLSDKKNDKQGVQMVLIRQFGDIVVQHVDQLTLQHACEQLKTYFK
>G0976 FRG_STAAU8325, UNDEFINED PRODUCT 977071:978240 REVERSE MW:43249
DFYDSETFKANLDRNDVRVIDDSIAQAMRDKIDEAKNEGDSIGGVVQVVVENMPVGVGSYVH YDRK
LDGKIAQGVVSINAFKGVSFGEGFKAAEKPGSEIQDEILYNSEIGYYRGSNHLGGLEGGMSN GMPIIVNGVMKPIPTLYKPLNSVDINTKEDFKATIERSDSCAVPAASIVCEHVVAFEIAKAL LEEFQSNHIEQLKQQIIERRQLNIEF
LOCUS 24:
G0243FRG
DRPIQVGSHFHFYEANAALDFEREMAYGKHLDIPAGAAVRFEPGDKKEVQLVEYAGKRKIFG FRGMVNGPIDESRVYRPTDENDEYAGVFGDNGAENVNKKGGKRS

>G0244_STAAU8325, UNDEFINED PRODUCT 218549:220261 FORWARD MW:61780
MSFKMTQNQYTSLYGPTVGDSIRLGDTNLFAQIEKDYAVYGEEATFGGGKSIRDGMAQNP
RVTRDDVNVADLVISNAVIIDYDKVVKADIGIKNGYIFAIGNAGNPDIMDNVDIIIGSTT
DIIAAEGKIVTAGGIDTHVHFINPEQAEVALESGITTHIGGGTGASEGSKATTVTPGPWH
IHRMLEAAEGLPINVGFTGKGQATNPTALIEQINAGAIGLKVHEDWGATPSALSHALDVA
DEFDVQIALHADTLNEAGFMEDTMAAVKDRVLHMYHTEGAGGGHAPDLIKSAAFSNILPS
STNPTLPYTHNTVDEHLDMVMITHHLNAAIPEDIAFADSRIRKETIAAEDVLQDMGVFSM
ISSDSQAMGRVGEVITRTWQVAHRMKEQRGPLDGDFEHNDNNRIKRYIAKYTINPAITHG
ISEYVGSIEPG
>LOCUS 25:
G0027_STAAU8325, UNDEFINED PRODUCT 32103:32513 REVERSE MW:16524
MNEYRNKKGPDYSIFKNNWKVLLMDTSKTIFSKYRWNKSFKAYKRSSDIVEFMLSKDDIL
RHSYELVQGLRKDLRLCNWPKFINRLNSVSKKSVSKGVWKVVKYYRKHQRMLRNTIYYPA
FNNGAIEGINNKIKLIK
LOCUS 26:
>G2458FRG_STAAU8325, UNDEFINED PRODUCT 2348221:2350185 REVERSE MW:69055
VKIMRVTELLTKDTIAMDLMANDKNGVIDELVNQLDKAGKLSDVASFKEAIHNRESQSTT
GIGEGIAIPHAKVAAVKSPAIAFGKSKAGVDYQSLDMQPAHLFFMIAAPEGGAQTHLDAL
AKLSGILMDENVREKLLHASSPEEVLAI
>G2459_STAAU8325, UNDEFINED PRODUCT 2350185:2351102 REVERSE MW:32573
MIYTVTFNPSIDYVIFTNDFKIDGLNRATATYKFAGGKGINVSRVLKTLDVESTALGFAG
GFPGKFIIDTLNNSAIQSNFIEVDEDTRINVKLKTGQETEINAPGPHITSTQFEQLLQQI
KNTTSEDIVIVAGSVPSSIPSDAYAQIAQITAQTGAKLVVDAEKELAESVLPYHPLFIKP
NKDELEVMFNTTVNSDTDVIKYGRLLVDKGAQSVIVSLGGDGAIYIDKEISIKAVNPQGK
VVNTVGSGDSTVAGMVAGIASGLTIEKAFQQAVACGTATAFDEDLATRDAIEKIKSQVTI
SVLDGE
G2460FRG
DRTGCSASTIRRDLSKLQQLGKLQRVHGGAM
LKENRMVEANLTEKLATNLDEKKMIAKIAANQINDNECLFIDAGSSTLELIKYIQAKDII
VVTNGLTHVEALLKKGIKTIMLGGQVKENTLATIGSSAMEILRRYCFDKAFIGMNGLDIE
LGLTTPDEQEALVKQTAMSLANQSFVLIDHSKFNKVYFARVPLLESTTIITSEKALNQES
LKEYQQKYHFIGGTL
LOCUS 27:
G1326FRG
GSPVLNSKHELIGILYAGSGKDESEKNFGVYFTPQLKEFIQNNIEK
>G1327_STAAU8325, UNDEFINED PRODUCT 1284689:1285450 FORWARD

MW:27870
MYLDIKIIKREELKMNKNVVIKSLAALTILTSVTGIGTTLVEEVQQTAKAENNVTKVKDT
NIFPYTGVVAFKSATGFVVGKNTILTNKHVSKNYKVGDRITAHPNSDKGNGGIYSIKKII
NYPGKEDVSVIQVEERAIERGPKGFNFNDNVTPFKYAAGAKAGERIKVIGYPHPYKNKYV
LYESTGPVMSVEGSSIVYSAHTESGNSGSPVLNSNNELVGIHFASDVKNDDNRNAYGVYF
TPEIKKFIAENIDK
>G1329_STAAU8325, .UNDEFINED PRODUCT 1285505:1286227 FORWARD MW:26340
LKMNKNIVIKSMAALAILTSVTGINAAVVEETQQIANAEKNVTQVKDTNIFPYNGVVSFK
DATGFVIGKNTIITNKHVSKDYKVGDRITAHPNGDKGNGGIYKIKSISDYPGDEDISVMN
IEEQAVERGPKGFNFNENVQAFNFAKDAKVDDKIKVIGYPLPAQNSFKQFESTGTIKRIK
DNILNFDAYIEPGNSGSPVLNSNNEVIGVVYGGIGKIGSEYNGAVYFTPQIKDFIQKHIE
Q
>G1330_STAAU8325, UNDEFINED PRODUCT 1286327:1287067 FORWARD MW:26652
MNKQRSTKMNKNIIIKSIAALTILTSITGVGTTVVDGIQQTAKAENSVKLITNTNVAPYS
GVTWMGAGTGFVVGNHTIITNKHVTYHMKVGDEIKAHPNGFYNNGGGLYKVTKIVDYPGK
EDIAVVQVEEKSTQPKGRKFKDFTSKFNIASEAKENEPISVIGYPNPNGNKLQMYESTGK
VLSVNGNIVTSDAVVQPGSSGSPILNSKREAIGVMYASDKPTGESTRSFAVYFSPEIKKF
IADNLDK
>G1332_STAAU8325, UNDEFINED PRODUCT 1287228:1287941 FORWARD MW:25679
MNKNIIIKSIAALTILTSVTGVGTTVVEGIQQTAKAEHNVKLIKNTNVAPYNGVVSIGSG
TGFIVGKNTIVTNKHVVAGMEIGAHIIAHPNGEYNNGGFYKVKKIVRYSGQEDIAILHVE
DKAVHPKNRNFKDYTGILKIASEAKENERISIVGYPEPYINKFQMYESTGKVLSVKGNMI
ITDAFVEPGNSGSAVFNSKYEVVGVHFGGNGPGNKSTKGYGVYFSPEIKKFIADNTDK
>G1333_STAAU8325, UNDEFINED PRODUCT 1288095:1288811 FORWARD MW:25655
MNKNIIIKSIAALTILTSITGVGTTMVEGIQQTAKAENTVKQITNTNVAPYSGVTWMGAG
TGFVVGNHTIITNKHVTYHMKVGDEIKAHPNGFYNNGGGLYKVTKIVDYPGKEDIAVVQV
EEKSTQPKGRKFKDFTSKFNIASEAKENEPISVIGYPNPNGNKLQMYESTGKVLSVNGNI
VSSDAIIQPGSSGSPILNSKHEAIGVIYAGNKPSGESTRGFAVYFSPEIKKFIADNLDK
>G1334FRAG._STAAU8325, UNDEFINED PRODUCT 1288994:1290730 FORWARD MW:66904
MILKAFESYNISIKFFNNNCATKTQNFHHQHPNYQHRNITKCYNKSITQRDKLLMQRRRN
HMSITEKQRQQQAELHKKLWSIANDLRGNMDASEFRNYILGLIFYRFLSEKAEQEYADAL
SGEDITYQEAWADEEYREDLKAELID
ORF1 (AF7)
SGTGFIVGKNTIVTNKHVVAGMEIGAHIIAHPNGEYNNGGFYKVKKIVRYSGQEDIAILH
VEDKAVHPKNRNFKDYTGILKIASEAKENERISIVGYPEPYINKFQMYESTGKVLSVKGN
MIITDAFVEPGNSGSAVFNSKYEVVGVHFGGNGPGNKSTKGYGVYFSPEIKKFIADNTDK
ORF2 (AF7)
MNKNIIIKSIAALTILTSITGVGTTMVEGIQQTAKAENTVKQITNTNVAPYS
GVTWMGAGTGFVVGNHTIITNKHVTYHMKVGDEIKAHPNGFYNNGGGLYKVTKIVDYPGK
EDIAVVQVEEKSTQPKGRKFKDFTSKFNIASEAKENEPISVIGYPNPNGNKLQMYESTGK
VLSVNGNIVSSDAIIQPGSSGSPILNSKHEAIGVIYAGNKPSGESTRGFAVYFSPEIKKF

IADNLDK
LOCUS 28 (H130)
>G1388_STAAU8325, UNDEFINED PRODUCT 1337496:1338446 REVERSE MW:36053
MGNHFQYAFENKRYHTWNYHLKNKFGQKIFKVALDGGFDCPNRDGTVAHGGCTFCSAAGS
GDFAGNRADSIAVQFKEIKEKMHEKWHEGKYIAYFQAFTNTHAPVEVLKEKFEPVLKEPG
VVGLSIGTRPDCLPDDVVEYLADLNQRTYLWVELGLQTIHQSTSDLINRAHDMKTYYDGV
AKLRKHNINVCTHIINGLPGEDYDMMMATAKEVAQMDVQGIKIHLLHLLKGTPMVKQYDK
GLLTFMTQEEYTNLVVDQLEVIPPEMIVHRITGDGPIDIMVGPMWSVNKWEVLNGIDAEL
ARRNSYQGLRYKSKVKQ
>G1389_STAAU8325, UNDEFINED PRODUCT 1338556:1339734 FORWARD MW:43345
MNIPKSVWWLVIGMALNITGSSFLWPLNTIYMKQELGKSLTVAGLVLMINSFGMVIGNLL
GGSLFDKLGGYKTILIGTFTCLCSTTLLNFFHGWPWYAVWLVMLGFGGGMIIPAIYAMAG
AVWPNGGRQTFNAIYLAQNIGVAVGAAMGGFVAEFSFNYIFLANLIMYVVFALVAVTQFN
IEINAKVKYPTHLDITGKKNKARFISLVLICAMFAICWVAYIQWESTIASFTQSINISMA
QYSVLWTINGIMILVAQPLIKPILYLLKGNLKKQMFVGIIIFMLSFFVTSFAENFTIFVV
GMIILTFGEMFVWPAVPTIANQLAPDGKQGQYQGFVNSAATVGKAFGPFLGGVLVDAFNM
RMMFIGMMLLLVFALILLMVFKENNTQPKKIDA
>G1390_STAAU8325, UNDEFINED PRODUCT 1340025:1342439 FORWARD MW:91754
VLNYNHNQIEKKWQDYWDENKTFKTNDNLGQKKFYALDMFPYPSGAGLHVGHPEGYTATD
IISRYKRMQGYNVLHPMGWDAFGLPAEQYALDTGNDPREFTKKNIQTFKRQIKELGFSYD
WDREVNTTDPEYYKWTQWIFIQLYNKGLAYVDEVAVNWCPALGTVLSNEEVIDGVSERGG
HPVYRKPMKQWVLKITEYADQLLADLDDLDWPESLKDMQRNWIGRSEGAKVSFDVDNTEG
KVEVFTTRPDTIYGASFLVLSPEHALVNSITTDEYKEKVKAYQTEASKKSDLERTDLAKD
KSGVFTGAYATNPLSGEKVQIWIADYVLSTYGTGAIMAVPAHDDRDYEFAKKFDLPIIEV
IEGGNVEEAAYTGEGKHINSGELDGLENEAAITKAIQLLEQKGAGEKKVNYKLRDWLFSR
QRYWGEPIPVIHWEDGTMTTVPEEELPLLLPETDEIKPSGTGESPLANIDSFVNVVDEKT
GMKGRRETNTMPQWAGSCWYYLRYIDPKNENMLADPEKLKHWLPVDLYIGGVEHAVLHLL
YARFWHKVLYDLAIVPTKEPFQKLFNQGMILGEGNEKMSKSKGNVINPDDIVQSHGADTL
RLYEMFMGPLDAAIAWSEKGLDGSRRFLDRVWRLMVNEDGTLSSKIVTTNNKSLDKVYNQ
TVKKVTEDFETLGFNTAISQLMVFINECYKVDEVYKPYIEGFVKMLAPIAPHIGEELWSK
LGHEESITYQPWPTYDEALLVDDEVEIVVQVNGKLRAKIKIAKDTSKEEMQEIALSNDNV
KASIEGKDIMKVIAVPQKLVNIVAK
LOCUS 29A (N10/GE2)
>G2804_STAAU8325, UNDEFINED PRODUCT 2682166:2682924 REVERSE MW:29096
MAYISLNYHSPTIGMHQNLTVILPEDQSFFNSDTTVKPLKTLMLLHGLSSDETTYMRYTS
IERYANEHKLAVIMPNVDHSAYANMAYGHSYYDYILEVYDYVHQIFPLSKKRDDNFIAGH
SMGGYGTIKFALTQGDKFAKAVPLSAVFEAQNLMDLEWNDFSKEAIIGNLSSVKGTEHDP
YYLLDKAVAEDKQIPKLLIMCGKQDFLYQDNLDFIDYLSRINVPYQFEDGPGDHDYAYWD
QAIKRAITWMVND

>G2805_STAAU8325, UNDEFINED PRODUCT 2683043:2685673 REVERSE MW:93576
LKKRIDYLSNKQNKYSIRRFTVGTTSVIVGATILFGIGNHQAQASEQSNDTTQSSKNNAS
ADSEKNNMIETPQLNTTANDTSDISANTNSANVDSTTKPMSTQTSNTTTTEPASTNETPQ
PTAIKNQATAAKMQDQTVPQEANSQVDNKTTNDANSIATNSELKNSQTLDLPQSSPQTIS
NAQGTSKPSVRTRAVRSLAVAEPVVNAADAKGTNVNDKVTASNFKLEKTTFDPNQSGNTF
MAANFTVTDKVKSGDYFTAKLPDSLTGNGDVDYSNSNNTMPIADIKSTNGDVVAKATYDI
LTKTYTFVFTDYVNNKENINGQFSLPLFTDRAKAPKSGTYDANINIADEMFNNKITYNYS
SPIAGIDKPNGANISSQIIGVDTASGQNTYKQTVFVNPKQRVLGNTWVYIKGYQDKIEES
SGKVSATDTKLRIFEVNDTSKLSDSYYADPNDSNLKEVTDQFKNRIYYEHPNVASIKFGD
ITKTYVVLVEGHYDNTGKNLKTQVIQENVDPVTNRDYSIFGWNNENVVRYGGGSADGDSA
VNPKDPTPGPPVDPEPSPDPEPEPTPDPEPSPDPEPEPSPDPDPDSDSDSDSGSDSDSGS
DSDSESDSDSDSDSDSDSDSDSESDSDSESDSESDSDSDSDSDSDSDSDSDSDSDSDS
DSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDS
DSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDS
DSDSDSDSDSDSDSDSDSDSDSRVTPPNNEQKAPSNPKGEVNHSNKVSKQHKTDALPE
TGDKSENTNATLFGAMMALLGSLLLFRKRKQDHKEKA
>G2806_STAAU8325, UNDEFINED PRODUCT 2686026:2686727 REVERSE MW:27428
MTENFILGRNNKLEHELKALADYINIPYSILQPYQSECFVRHYTKGQVIYFSPQESSNIY
FLIEGNIIREHYNQNGDVYRYFNKEQVLFPISNLFHPKEVNELCTALTDCTVLGLPRELM
AFLCKANDDIFLTLFALINDNEQQHMNYNMALTSKFAKDRIIKLICHLCQTVGYDQDEFY
EIKQFLTIQLMSDMAGISRETAGHIIHELKDEKLVVKDHKNWLVSKHLFNDVCV
LOCUS 30 (N15)
>G2078_STAAU8325, UNDEFINED PRODUCT 1955555:1957645 REVERSE MW:77813
MQKAFRNVLVIVIIGVIIFGLFSYLNGNGNMPKQLTYNQFTEKLEKGDLKTLEIQPQQNV
YMVSGKTKNDEDYSSTILYNNEKELQKITDAAKKQNGVKLTIKEEEKQSVFVSILSTLIP
VVVIALLFIFFLSQAQGGGSGGRMMNFGKSKAKMYDNNKRRVRFSDVAGADEEKQELIEI
VDFLKDNKKFKEMGSRIPKGVLLVGPPGTGKTLLARAVAGEAGAPFFSISGSDFVEMFVG
VGASRVRDLFDNAKKNAPCIIFIDEIDAVGRQRGAGVGGGHDEREQTLNQLLVEMDGFGE
NEGIIMIAATNRPDILDPALLRPGRFDRQIQVGRPDVKGREAILHVHAKNKPLDETVDLK
AISQRTPGFSGADLENLLNEASLIAVREGKKKIDMRDIEEATDRVIAGPAKKSRVISKKE
RNIVAHHEAGHTIIGMVLDEAEVVHKVTIVPRGQAGGYAMMLPKQDRFLMTEQELLDKIC
GLLGGRVSEDINFNEVSTGASNDFERATQIARSMVTQYGMSKKLGPLQFGHSNGQVFLGK
DMQGEPNYSSQIAYEIDKEVQRIVKEQYERCKQILLEHKEQLILIAETLLTEETLVAEQI
QSLFYEGKLPEIDYDAAKVVKDEDSEFNDGKFGKSYEEIRKEQLEDGQRDESEDRKEEKD
IAEDKKEADKSDEKDEPAHRQAPNIEKPYDPNHPDNK
>G2077_STAAU8325, UNDEFINED PRODUCT 1954445:1955323 REVERSE MW:31822
MTHDYIVKALAFDGEIRAYAALTTETVQEAQTRHYTWPTASAAMGRTMTATAMMGAMLKG
DQKLTVTVDGQGPIGRIIADANAKGEVRAYVDHPQTHFPLNEQGKLDVRRAVGTNGSIMV
VKDVGMKDYFSGASPIVSGELGEDFTYYYATSEQTPSSVGLGVLVNPDNTIKAAGGFIIQ
VMPGAKDETISKLEKAISEMTPVSKLIEQGLTPEGLLNEILGEDHVQILEKMPVQFECNC
SHEKFLNAIKGLGEAEIQNMIKEDHGAEAVCHFCGNKYKYTEEELNVLLESLA

LOCUS 31
>G2117_STAAU8325, UNDEFINED PRODUCT 1991063:1995499 REVERSE MW:170933
DQLDVVNRWRQNETYKTMAVPLGVRGKDDILSLNLH
EKAHGPHGLVAGTTGSGKSEIIQSYILSLAINFHPHEVAFLLIDYKGGGMANLFKDLVHL
VGTITNLDGDEAMRALTSIKAELRKRQRLFGEHDVNHINQYHKLFKEGIATEPMPHLFII
SDEFAELKSEQPDFMKELVSTARIGRSLGIHLILATQKPSGVVDDQIWSNSKFKLALKVQ
DRQDSNEILKTPDAADITLPGRAYLQVGNNEIYELFQSAWSGATYDIEGDKLEVEDKTIY
MINDYGQLQAINKDLSGLEDEETKENQTELEAVIDHIESITTRLEIEEVKRPWLPPLPEN
VYQEDLVETDFRKLWSDDAKEVELTLGLKDVPEEQYQGPMVLQLKKAGHIALIGSPGYGR
TTFLHNIIFDVARHHR
LOCUS 32 HE9
>G2647_STAAU8325, UNDEFINED PRODUCT 2528508:2529707 REVERSE MW:44138
VINMLYLEVLKNRNFTYLLIGNFLRRSCFVLFSLQIIWFTVELTNQSSLKLSMMVMSQTL
PFIIFGIFGGAYSDKHNKKKILYLS
LOCUS 32 P9
>G2648_STAAU8325, UNDEFINED PRODUCT 2530085:2534971 REVERSE MW:178787
DPKLPTGEKEEVPGKPGIKNPETGDVVR
PPVDSVTKYGPVKGDSIVEKEEIPFEKERKFNPDLAPGTEKVTREGQKGEKTITTPTLKN
PLTGEIISKGESKEEITKDPINELTEYGPETITPGHRDEFDPKLPTGEKEEVPGKPGIKN
PETGDVVRPPVDSVTKYGPVKGDSIVEKEEIPFEKERKFNPDLAPGTEKVTREGQKGEKT
ITTPTLKNPLTGVIISKGEPKEEITKDPINELTEYGPETITPGHRDEFDPKLPTGEKEEV
PGKPGIKNPETGDVVRPPVDSVTKYGPVKGDSIVEKEEIPFKKERKFNPDLAPGTEKVTR
EGQKGEKTITTPTLKNPLTGEIISKGESKEEITKDPINELTEYGPETITPGHRDEFDPKL
PTGEKEEVPGKPGIKNPETGDVVRPPVDSVTKYGPVKGDSIVEKEEIPFEKERKFNPDLA
PGTEKVTREGQKGEKTITTPTLKNPLTGEIISKGESKEEITKDPINELTEYGPETITPGH
RDEFDPKLPTGEKEEVPGKPGIKNPETGDVVRPPVDSVTKYGPVKGDSIVEKEEIPFKKE
RKFNPDLAPGTEKVTREGQKGEKTITTPTLKNPLTGEIISKGESKEEITKDPINELTEYG
PETITPGHRDEFDPKLPTGEKEEVPGKPGIKNPETGDVVRPPVDSVTKYGPVKGDSIVEK
EEIPFEKERKFNPDLAPGTEKVTREGQKGEKTITTPTLKNPLTGEIISKGESKEEITKDP
INELTEYGPETITPGHRDEFDPKLPTGEKEEVPGKPGIKNPETGDVVRPPVDSVTKYGPV
KGDSIVEKEEIPFEKERKFNPDLAPGTEKVTREGQKGEKTITTPTLKNPLTGEIISKGES
KEEITKDPVNELTEFGGEKIPQGHKDIFDPNLPTDQTEKVPGKPGIKNPDTGKVIEEPVD
DVIKHGPKTGTPETKTVEIPFETKREFNPKLQPGEERVKQEGQPGSKTITTPITVNPLTG
EKVGEGQPTEEITKQPVDKIVEFGGEKPKDPKGPENPEKPSRPTHPSGPVNPNNPGLSKD
RAKPNGPVHSMDKNDKVKKSKIAKESVANQEKKRAELPKTGLESTQKGLIFSSIIGIAGL
MLLARRRKN
LOCUS 33
>G2811_STAAU8325, UNDEFINED PRODUCT 2691933:2692430 REVERSE MW:19378
MNLFFNTRNVTTKGVYNMKKSKRLEIVSTIVKKHKIYKKEQIISYIEEYFGVRYSATTIA
KDLKELNIYRVPIDCETWIYKAINNQTEQEMREKFRHYCEHEVLSSIINGSYIIVKTSPG
FAQGINYFID

>G2812_STAAU8325, UNDEFINED PRODUCT 2692749:2694275 REVERSE MW:56329
QATLITNEDENFVKDEQRAGVDANYYAKQTYDYYKDTFGRESYDN
QGSPIVSLTHVNNYGGQDNRNNAAWIGDKMIYGDGDGRTFTSLSGANDVVAHELTHGVTQ
ETANLEYKDQSGALNESFSDVFGYFVDDEDFLMGEDVYTPGKEGDALRSMSNPEQFGQPA
HMKDYVFTEKDNGGVHTNSGIPNKAAYNVIQAIGKSKSEQIYYRALTEYLTSNSNFKDCK
DALYQAAKDLYDEQTAEQVYEAWNEVGVE
LOCUS 34
>G1540_STAAU8325, UNDEFINED PRODUCT 1494147:1495196 FORWARD MW:38745
MTKHYLNSKYQSEQRSSAMKKITMGTASIILGSLVYIGADSQQVNAATEATNATNNQSTQ
VSQATSQPINFQVQKDGSSEKSHMDDYMQHPGKVIKQNNKYYFQTVLNNASFWKEYKFYN
ANNQELATTVVNDNKKADTRTINVAVEPGYKSLTTKVHIVVPQINYNHRYTTHLEFEKAI
PTLADAAKPNNVKPVQPKPAQPKTPTEQTKPVQPKVEKVKPTVTTTSKVEDNHSTKVVST
DTTKDQTKTQTAHTVKTAQTAQEQNKVQTPVKDVATAKSESNNQAVSDNKSQQTNKVTKH
NETPKQASKAKELPKTGLTSVDNFISTVAFATLALLGSLSLLLFKRKESK
>G1539_STAAU8325, UNDEFINED PRODUCT 1493258:1493938 REVERSE MW:24836
LKNILKVFNTTILALIIIIATFSNSANAADSGTLNYEVYKYNTNDTSIANDYFNKPAKYI
KKNGKLYVQITVNHSHWITGMSIEGHKENIISKNTAKDERTSEFEVSKLNGKIDGKIDVY
IDEKVNGKPFKYDHHYNITYKFNGPTDVAGANAPGKDDKNSASGSDKGSDGTTTGQSESN
SSNKDKVENPQTNAGTPAYIYAIPVASLALLIAITLFVRKKSKGNVE
LOCUS 35 P15
>G2062_STAAU8325, UNDEFINED PRODUCT 1927377:1928480 FORWARD MW:40937
NSYLSDEVTRVGRGTLRKIGPKDRIIKPLT
YLYNKDLERTGLLNTAALLLKYDDTADQETVEKNNYIKEHGLKAFLSEYAKVDDGLADEI
IEAYNSLS
>G2063_STAAU8325, UNDEFINED PRODUCT 1928805:1936238 REVERSE MW:263021
AVVTANADIDNAAANNDVDNAKTTNEATIAAITPDANVKPAAKQAIADKV
QAQETAIDGNNGSTTEEKAAAKQQVQTEKTTADAAIDAAHTNAEVEAAKKAAIAKIEAIQ
PATTTKDNAKEAIATKANERKTAIAQTQDITAEEIAAANADVDNAVTQANSNIEAANSQN
DVDQAKTTGENSIDQVTPTVNKKATARNEITAILNNKLQEIQATPDATDEEKQAADAEAN
TENGKANQAISAATTNAQVDEAKANAEAAINAVTPKVVKKQAAKDEIDQLQATQTNVINN
DQNATTEEKEAAIQQLATAVTDAKNNITAATDDNGVDQAKDAGKNSIQSTQPATAVKSNA
KNDVDQAVTTQNQAIDNTTGATTEEKNAAKDLVLKAKEKAYQDILNAQTTNDVTQIKDQA
VADIQGITADTTIKDVAKDELATKANEQKALIAQTADATTEEKEQANQQVDAQLTQGNQN
IENAQSIDDVNTAKDNAIQAIDPIQASTDVKTNARAELLTEMQNKITEILNNNETTNEEK
GNDIGPVRAAYEEGLNNINAATTTGDVTTAKDTAVQKVQQLHANPVKKPAGKKELDQAAA
DKKTQIEQTPNASQQEINDAKQEVDTELNQAKTNVDQSSTNEYVDNAVKEGKAKINAVKT
FSEYKKDALAKIEDAYNAKVNEADNSNASTSSEIAEAKQKLAELKQTADQNVNQATSKDD
IEVQIHNDLDNINDYTIPTGKKESATTDLYAYADQKKNNISADTNATQDEKQQAIKQVDQ
NVQTALESINNGVDNGDVDDALTQGKAAIDAIQVDATVKPKANQAIEVKAEDTKESIDQS
DQLTAEEKTEALAMIKQITDQAKQGITDATTTAEVEKAKAQGLEAFDNIQIDSTEKQKAI
EELETALDQIEAGVNVNADATTEEKEAFTNALEDILSKATEDISDQTTNAEIATVKNSAL

EQLKAQRINPEVKKNALEAIREVVNKQIEIIKNADADASAKEIARTDLGRYFDRFADKLD
KTQTNAEVAELQNVTIPAIEAIVPQNDPDANDTNNGIDNNDATANSNANATPENTGQPNV
SETTANGKADASPTTPNNSDAATGETTATSATDDANDKPQANNNSSVDASTNSPTMDNDV
TSKPEVESTNNGTTDKPVTETDNATPAESTTNNNSTTTATNENAPTGSTATAPTTASTEA
ASSADSKDNASVNDSKQNAEVNNSAESQSTNDKVAQPKSENKAKAEKDGSDSTNQSMVES
TTETLPSADITEPNVPSNTSKDKEESTTNQTDAGQLKSETNVASNEADKSPSKADTEVSN
KPSTSASSEAKEKMTSTNVSQKDDTATADTNDTQKSVGSAANNKATQNDGANASPATVSN
GSNSANQDMLNVTNTDDHQAKTKSAQQGKVNKAKQQAKTLPDTGMSHNDDLPYAELALGA
GMAFLIRRFTKKDQQTEE
LOCUS 36
>G2732_STAAU8325, UNDEFINED PRODUCT 2619995:2620498 REVERSE MW:19899
MKKEIKMAINIIEYNRSYKEELIEFILSIQKNEFNIKIDRDDQP
>G2733_STAAU8325, UNDEFINED PRODUCT 2620759:2621457 REVERSE MW:24203
MKKTIMASSLAVALGVTGYAAGTGHQAHAAEVNVDQAHLVDLAHNHQDQLNAAPIKDGAY
DIHFVKDGFQYNFTSNGTTWSWSYEAANGQTAGFSNVAGADYTTSYNQGSNVQSVSYNAQ
SSNSNVEAVSAPTYHNYSTSTTSSSVRLSNGNTAGATGSSAAQIMAQRTGVSASTWAAII
ARESNGQVNAYNPSGASGLFQTMPGWGPTNTVDQQINAAVKAYKAQGLGAWGF
>G2734_STAAU8325, UNDEFINED PRODUCT 2622068:2623216 REVERSE MW:40979
SASIGISATEAVLIIGTSKVNRLGVPLSVFFGGVKMMIPNMVKYPILMLPILTTA
IVSGLVSALVGIHGTKESAGFGFIGMVGPINAFKFMEVDSAWLSVLLIVVAFFVVPFVTA
WLADIIYRKVFRLYTNDIFKFMG
LOCUS 37
>G2805_STAAU8325, UNDEFINED PRODUCT 2683043:2685673 REVERSE MW:93576
LKKRIDYLSNKQNKYSIRRFTVGTTSVIVGATILFGIGNHQAQASEQSNDTTQSSKNNAS
ADSEKNNMIETPQLNTTANDTSDISANTNSANVDSTTKPMSTQTSNTTTTEPASTNETPQ
PTAIKNQATAAKMQDQTVPQEANSQVDNKTTNDANSIATNSELKNSQTLDLPQSSPQTIS
NAQGTSKPSVRTRAVRSLAVAEPVVNAADAKGTNVNDKVTASNFKLEKTTFDPNQSGNTF
MAANFTVTDKVKSGDYFTAKLPDSLTGNGDVDYSNSNNTMPIADIKSTNGDVVAKATYDI
LTKTYTFVFTDYVNNKENINGQFSLPLFTDRAKAPKSGTYDANINIADEMFNNKITYNYS
SPIAGIDKPNGANISSQIIGVDTASGQNTYKQTVFVNPKQRVLGNTWVYIKGYQDKIEES
SGKVSATDTKLRIFEVNDTSKLSDSYYADPNDSNLKEVTDQFKNRIYYEHPNVASIKFGD
ITKTYVVLVEGHYDNTGKNLKTQVIQENVDPVTNRDYSIFGWNNENVVRYGGGSADGDSA
VNPKDPTPGPPVDPEPSPDPEPEPTPD
>G2806_STAAU8325, UNDEFINED PRODUCT 2686026:2686727 REVERSE MW:27428
DHKNWLVSKHLFNDVCV

LOCUS 38
>G0307_STAAU8325, UNDEFINED PRODUCT 273255:274481 REVERSE MW:45016
ILVVLNLFLAWFFIYFDWGQKAVRGAA
NGIAWVVQSAHAGTGFAFASLTNVKMMDMAVAALFPILLIVPLFDILMYFNILPKIIGGI
GWLLAKVTRQPKFESFFGIEMMFLGNTEALAVSSEQLKRMNEMRVLTIAMMSMSSVSGAI
VGAYVQMVPGELVLTAIPLNIVNAIIVSCLLNPVSVEEKEDIIYSLKNNEVERQPFFSFL
GDSVLAAGKLVLIIIAFVISFVALADLFDRFINLITGLIAGWIGIKGSFGLNQILGVFMY
PFALLLGLPYDEAWLVAQQMAKKIVTNEFVVMGEISKDIASYTPHHRAVITTFLISFANF
STIGMIIGTLKGIVDKKTSDFVSKYVPMMLLSGILVSLLTAAFVGLFAW
LOCUS 39
>G0761_STAAU8325, UNDEFINED PRODUCT 754164:754763 REVERSE MW:23413
MRISMEGFSVINFDNFKKYQESFGYMAQQLCFPEKLTFHPKTFEETISK
>G0762_STAAU8325, UNDEFINED PRODUCT 754732:756288 REVERSE MW:59413
LKIKAQVAMVLNLDKCIGCHTCSVTCKNTWTNRPGAEYMWFNNVETKPGVGYPKRWEDQE
HYKGGWVLNRKGKLELKSGSRISKIALGKIFYNPDMPLIKDYYEPWNYNYEHLTTAKSGK
HSPVARAYSEITGDNIEIEWGPNWEDDLAGGHVTGPKDPNIQKIEEDIKFQFDETFMMYL
PRLCEHCLNPSCVASCPSGAMYKRDEDGIVLVDQDACRGWRYCMTGCPYKKVYFNWKTNK
AEKCTFCFPRIEAGMPTVCSETCTGRMRYLGVLLYDADRVHEAASAVDEKDLYEKQLDIF
LNPFDEEVIAQAEKDGIGYDWIEAAQNSPIYKLAIEYKLAFPLHPEFRTMPMVWYCPPLS
PIMSYFEGKNTTQNPDAIFPAIEEMRLPIEYLANIFTAGDTEPVKGALQRMAMMRSYMRS
QVTQQPFDTSRLERLGITERQTKDMYRLLGLAKYEDRFVIPTSHKETYLDTYHAQGSTGY
NYGGEHFGDNCEGCGVAVGSGKTGQEIYNENFYGGIFRD
>G0763_STAAU8325, UNDEFINED PRODUCT 756281:759967 REVERSE MW:139830
DHEVFQQFGESLPVYKPTLPPMVFGNRDKKIKGGTDALVL
RYLTPHGKWNIHSMYQDNKHMLTLFRGGPTVWISNEDAEKHDIQDNDWLEVYNRNGVVTA
RAVISHRMPKGTMFMYHAQDKHIQTPGSEITDTRGGSHNAPTRIHLKPTQLVGGYAQISY
HFNYYGPIGNQRDLYVAVRKMKEVNWLED
LOCUS 40
>G2781_STAAU8325, UNDEFINED PRODUCT 2662464:2663147 REVERSE MW:26238
MTNQFKNKQSKLHDSLESITKNLYATPTSELPFDNRFLFKSFILKRETGNIVIYHSGHLG
DSQQDIASLGGVSKVLMNH
>G2782_STAAU8325, UNDEFINED PRODUCT 2663414:2665033 REVERSE MW:60237
LKKEKVMDWTTFIGTVAVLLFAVIPMMAFPKASEDIITGINSAISDSIGSIYLFMGLAIF
CFVMYIAFGKYGNVTLGKASDKPEFNTFTWAAMLFCAGIGSDILYWGVIEWAFYYQVPPN
GAKSMSDEALQYATQYGMFHWGPIAWAIYVLPALPIGYLVFVKKQPVYKISQACRPILKG
QTDKFVGKVVDILFIFGLLGGAATSLALGVPLISAGIERLTGLDGKNMILRSAILLTITV
IFAISSYTGLKKGIQKLSDINVWLSFVLLAFIFIIGPTVFIMETTVTGFGNMLRDFFHMA

TWLEPFGGIKGRKETNFPQDWTIFYWSWWLVYAPFIGLFIARISKGRRLKEVVLGTIIYG
TLGCVLFFGIFGNYAVYLQISGQFNVTQYLNTHGTEATIIEVVHHLPFPSLMIVLFLVSA
FLFLATTFDSGSYILAAASQKKVVGEPLRANRLFWAFALCLLPFSLMLVGGERALEVLKT
ASILASVPLIVIFIFMMISFLIILGRDRIKLETRAEKLKEVERRSLRIVQVSEEEQDDNL
>G2787_STAAU8325, UNDEFINED PRODUCT 2666088:2667935 REVERSE MW:70480
DHCYECDYDGDFEATEKGFKCPNCGNDNPKTVDVVKRTCGYLGNPVQRPVIKGR
HKEICARVKHMKAPKE
LOCUS 41
>G2567_STAAU8325, UNDEFINED PRODUCT 2448105:2448794 REVERSE MW:25305
LISMEWILFDKDGTLIEFDRSWEKIGVRFVQSLLETFPVHNKEAALRQLGVIKESIDPKS
VMGSGSLQQIIQAFNDVTGQDTTDWSKSTSQKLVDERIPEINWVEGVKEALIDLKAKGYQ
LGIVTSDTKKGVEQFLAHTNATSLFDLIISTEADAYEKPNPKVLSPLFEQYNVD
>G2568_STAAU8325, UNDEFINED PRODUCT 2448892:2449062 REVERSE MW:6765
LESRCTKILIKIEYNHENNMQKLIMTKIPFNEAKHGNKLSLQCLLLSIEGDFTYYYI
>G2569_STAAU8325, UNDEFINED PRODUCT 2449038:2450111 REVERSE MW:40086
MSQAVKVERRETLKQKPNTSQLGFGKYFTDYMLSYDYDADKGWHDLKIVPYGPIEISPAA
QGVHYGQSVFEGLKAYKRDGEVALFRPEENFKRLNNSLARLEMPQVDEAELLEGLKQLVD
IERDWIPEGEGQSLYIRPFVFATEGALGVGASHQYKLLIILSPSGAYYGGETLKPTKIYV
EDEYVRAVRGGVGFAKVAGNYAASLLAQTNANKLGYDQVLWLDGVEQKYIEEVGSMNIFF
VENGKVITPELNGSILPGITRKSIIELAKNLGYEVEERRVSIDELFESYDKGELTEVFGS
GTAAVISPVGTLRYEDREIVINNNETGEITQKLYDVYTGIQNGTLEDKNGWRVVVPKY
>G2570_STAAU8325, UNDEFINED PRODUCT 2450449:2451411 REVERSE MW:36053
DPKYDLASMTKLMLEAIEQKDTVKNNN
LOCUS 42
G2383
>G2383_STAAU8325, UNDEFINED PRODUCT 2270269:2271210 REVERSE MW:35868
MSFASEMKNELTRIDVDEMNAKAELSALIRMNGALSLSNQQFVINVQTENATTARRIYSL
IKRVFNVEVEILV
G2384
>G2383_STAAU8325, UNDEFINED PRODUCT 2270269:2271210 REVERSE MW:35868
MSFASEMKNELTRIDVDEMNAKAELSALIRMNGALSLSNQQFVINVQTENATTARRIYSL
IKRVFNVEVEILVRKKMKLKKNNIYICRTKMKAKEILDELGILKDGIFTHEIDHSMIQDD
EMRRSYLRGAFLAGGSVNNPETSSYHLEIFSQNESHAEGLTKLMNSYELNAKHLERKKGS
ITYLKEAEKISDFLSLIGGYQALLKFEDVRIVRDMRNSVNRLVNCETANLNKTVSAAMKQ

VESIKLIDKEIGIENLPDRLREIARIRVEHQEISLKELGEMVSTGPISKSGVNHRLRKLN
DLADKIRNGEQIEL
G2385
>G2385_STAAU8325, UNDEFINED PRODUCT 2272315:2273223 REVERSE MW:34812
SLINAINDEREHLSQIRSIANFVIDTTKLSPKELKERIRRYYEDEEFETFTINVT
SFGFKHGIQMDADLVFDVRFLPNPYYVVDLRPLTGLDKDVYNYVMKWKETEIFFEKLTDL
LDFMIPGYKKEGKSQLVIAIGCTGGQHRSVALAERLGNYLNEVFEYNVYVHHRDAHIESG
EKK
LOCUS 43
G1925
>G1925_STAAU8325, UNDEFINED PRODUCT 1807198:1808076 FORWARD MW:33043
DQLIAKYDL
G1926
>G1926_STAAU8325, UNDEFINED PRODUCT 1808110:1809648 FORWARD MW:56155
MLPMKEVGFGTLNWVAVIIYLLAMLFIGVYFTKRASQSTNSFFTASGRLPSWVVGFSIYA
TTLSAITFMSTPEKAFLTDWSYIAGNIAIVAIIPLLIYFYVPFFKKLKVTSAYEYLEARF
GPSIRVIGSLLFVVYHLGRVAIVIYLPTLAITSVSDMNPYIVASLVGLLCILYTFLGGFE
GVVWSDFIQGVILLGGALVIIILGVVNIKGGFGTVFADAIEHKKLISADNWKLNTAAAAI
PIIFLGNIFNNLYQYTASQDVVQRYQASDSLKETNKSLWTNGILALISAPLFYGMGTMLY
SFYTHEAVLPKGFNTSSVVPYFILTEMPPFVAGLLIAAIFAAAQSTISSSLNSISACISI
DIKQRFFGKGSERHEVNFARFIIIIAGIFGFGMSLYLIASNSNDLWDLFLFVTGLFGVPL
AGVFAVGIFTKRTNTFGVICGLILGIIFAYVYNGVGKGNSPFYVSTISFTVAFVFAYILS
FIVPSKHKKDITGLTIFEKDKPSTYISKTATKK
G1927
>G1927_STAAU8325, UNDEFINED PRODUCT 1809759:1810976 REVERSE MW:44221
SKAGINFVFGDIQNKNGFTFFLNVLLPLVFISVLIGIFNYIKVLPFIIKYV
GIAINKITRMGRLESYFAISTAMFGQPEVYLTIKDIIPRLSRAKLYTIATSGMSAVSMAM
LGSYMQMIEPKFVVTAVMLNIFSALIIASVINPYKSDDTDVEIDNLTKSTETKTLNGKTG
KPKKVAFFQMIGDSAMDGFKIAVVVAVMLLAFISLMEAINIMFGSVGLNFKQLIGYVFAP
IAFLMGIPWSEAVPAGSLMATKLITNEFVAMLDFKNVLGDVSARTQGIISVYLVSFANFG
TVGIIVGSIKGISDKQGEKVASFAMRLLLGSTLASIISGSIIGLVL
LOCUS 44

>G2207_STAAU8325, UNDEFINED PRODUCT 2094883:2096472 FORWARD MW:59177
PLSSLNPRLTIGKQITEVIFQHKRVSKSEAKSMTIDILEKVGIKHATRQFDAYPHELSGGMR
QRVMIAMALILKPQILIADEPTTALDASTQNQLLQLMKSLYEYTETSIIFITHDLGAVYQFC
DDVIVMKDGSVVESGTV
ESIFKSPQHTYTKRLIDAIPDIHQTRPPRPLNNDILLKFDRVSVDYTSPSGSLYRAVNDI
NLAIRKGETLGIVGESGSGKSTLAKTVVGLKEVSEGFIWYNELPLSLFKDDELKSLRQEI
QMIFQDPFASINPRFKVIDVIKRPLIIHGKVKDNDDIIKTVVSLLEKVGLDQTFLYRYPH
ELSGGQRQRVSIARALAVEPKVIVCDEAVSALDVSIQKDIIELLKQLQLDFGITYLFITH
DMGVINEIC
LOCUS 45
>G2152_STAAU8325, UNDEFINED PRODUCT 2029896:2030945 REVERSE MW:39494
DQRYYTGSRDENVLSQKLPMSLIHEGVGEVVFDSKGVFNKGTKVVMVPNTPTEKDDVIA
LOCUS 46 G5(1)
>G2647_STAAU8325, UNDEFINED PRODUCT 2528508:2529707 REVERSE MW:44138
VINMLYLEVLKNRNFTYLLIGNFLRRSCFVLFSLQIIWFTVELTNQSSLKLSMMVMSQTL
PFIIFGIFGGAYSDKHNKKKILYLS
>G2648_STAAU8325, UNDEFINED PRODUCT 2530085:2534971 REVERSE MW:178787
PKLPTGEKEEVPGKPGIKNPETGDVVR
PPVDSVTKYGPVKGDSIVEKEEIPFEKERKFNPDLAPGTEKVTREGQKGEKTITTPTLKN
PLTGEIISKGESKEEITKDPINELTEYGPETITPGHRDEFDPKLPTGEKEEVPGKPGIKN
PETGDVVRPPVDSVTKYGPVKGDSIVEKEEIPFEKERKFNPDLAPGTEKVTREGQKGEKT
ITTPTLKNPLTGVIISKGEPKEEITKDPINELTEYGPETITPGHRDEFDPKLPTGEKEEV
PGKPGIKNPETGDVVRPPVDSVTKYGPVKGDSIVEKEEIPFKKERKFNPDLAPGTEKVTR
EGQKGEKTITTPTLKNPLTGEIISKGESKEEITKDPINELTEYGPETITPGHRDEFDPKL
PTGEKEEVPGKPGIKNPETGDVVRPPVDSVTKYGPVKGDSIVEKEEIPFEKERKFNPDLA
PGTEKVTREGQKGEKTITTPTLKNPLTGEIISKGESKEEITKDPINELTEYGPETITPGH
RDEFDPKLPTGEKEEVPGKPGIKNPETGDVVRPPVDSVTKYGPVKGDSIVEKEEIPFKKE
RKFNPDLAPGTEKVTREGQKGEKTITTPTLKNPLTGEIISKGESKEEITKDPINELTEYG
PETITPGHRDEFDPKLPTGEKEEVPGKPGIKNPETGDVVRPPVDSVTKYGPVKGDSIVEK
EEIPFEKERKFNPDLAPGTEKVTREGQKGEKTITTPTLKNPLTGEIISKGESKEEITKDP
INELTEYGPETITPGHRDEFDPKLPTGEKEEVPGKPGIKNPETGDVVRPPVDSVTKYGPV
KGDSIVEKEEIPFEKERKFNPDLAPGTEKVTREGQKGEKTITTPTLKNPLTGEIISKGES
KEEITKDPVNELTEFGGEKIPQGHKDIFDPNLPTDQTEKVPGKPGIKNPDTGKVIEEPVD
DVIKHGPKTGTPETKTVEIPFETKREFNPKLQPGEERVKQEGQPGSKTITTPITVNPLTG
EKVGEGQPTEEITKQPVDKIVEFGGEKPKDPKGPENPEKPSRPTHPSGPVNPNNPGLSKD
RAKPNGPVHSMDKNDKVKKSKIAKESVANQEKKRAELPKTGLESTQKGLIFSSIIGIAGL
MLLARRRKN
LOCUS 47 HF6
>G2560_STAAU8325, UNDEFINED PRODUCT 2436743:2440789 REVERSE MW:146086
MLNRENKTAITRKGMVSNRLNKFSIRKYTVGTASILVGTTLIFGLGNQEAKAAESTNKEL
NEATTSASDNQSSDKVDMQQLNQEDNTKNDNQKEMVSSQGNETTSNGNKLIEKESVQSTT

GNKVEVSTAKSDEQASPKSTNEDLNTKQTISNQEALQPDLQENKSVVNVQPTNEENKKVD
AKTESTTLNVKSDAIKSNDETLVDNNSNSNNENNADIILPKSTAPKRLNTRMRIAAVQPS
STEAKNVNDLITSNTTLTVVDADKNNKIVPAQDYLSLKSQITVDDKVKSGDYFTIKYSDT
VQVYGLNPEDIKNIGDIKDPNNGETIATAKHDTANNLITYTFTDYVDRFNSVQMGINYSI
YMDADTIPVSKNDVEFNVTIGNTTTKTTANIQYPDYVVNEKNSIG
>G2561_STAAU8325, UNDEFINED PRODUCT 2441159:2444143 REVERSE MW:107795
ETSDS
DSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDS
DSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDS
DSDSDSDSDSDSDSDSDNDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDS
DSDSDSDSDSDSDSDSDSDSDNDSDSDSDSDSDAGKHTPAKPMSTVKDQHKTAKALPE
TGSENNNSNNGTLFGGLFAALGSLLLFGRRKKQNK
LOCUS 49 B13
G1539
>G1539_STAAU8325, UNDEFINED PRODUCT 1493258:1493938 REVERSE MW:24836
LKNILKVFNTTILALIIIIATFSNSANAADSGTLNYEVYKYNTNDTSIANDYFNKPAKYI
KKNGKLYVQITVNHSHWITGMSIEGHKENIISKNTAKDERTSEFEVSKLNGKIDGKIDVY
IDEKVNGKPFKYDHHYNITYKFNGPTDVAGANAPGKDDKNSASGSDKGSDGTTTGQSESN
SSNKDKVENPQTNAGTPAYIYAIPVASLALLIAITLFVRKKSKGNVE
G1540
>G1540_STAAU8325, UNDEFINED PRODUCT 1494147:1495196 FORWARD MW:38745
MTKHYLNSKYQSEQRSSAMKKITMGTASIILGSLVYIGADSQQVNAATEATNATNNQSTQ
VSQATSQPINFQVQKDGSSEKSHMDDYMQHPGKVIKQNNKYYFQTVLNNASFWKEYKFYN
ANNQELATTVVNDNKKADTRTINVAVEPGYKSLTTKVHIVVPQINYNHRYTTHLEFEKAI
PTLADAAKPNNVKPVQPKPAQPKTPTEQTKPVQPKVEKVKPTVTTTSKVEDNHSTKVVST
DTTKDQ
LOCUS 49 K16
G1540
>G1540_STAAU8325, UNDEFINED PRODUCT 1494147:1495196 FORWARD MW:38745
DQTKTQTAHTVKTAQTAQEQNKVQTPVKDVATAKSESNNQAVSDNKSQQTNKVTKH
NETPKQASKAKELPKTGLTSVDNFISTVAFATLALLGSLSLLLFKRKESK
G1542
>G1542_STAAU8325, UNDEFINED PRODUCT 1495403:1497337 FORWARD MW:72192
MNKQQKEFKSFYSIRKSSLGVASVAISTLLLLMSNGEAQAAAEETGGTNTEAQPKTEAVA
SPTTTSEKAPETKPVANAVSVSNKEVEAPTSETKEAKEVKEVKAPKETKEVKPAAKATNN
TYPILNQELREAIKNPAIKDKDHSAPNSRPIDFEMKKKDGTQQFYHYASSVKPARVIFTD

SKPEIELGLQSGQFWRKFEVYEGDKKLPIKLVSYDTVKDYAYIRFSVSNGTKAVKIVSST
HFNNKEEKYDYTLMEFAQPIYNSADKFKTEEDYKAEKLLAPYKKAKTLERQVYELNKIQD
KLPEKLKAEYKKKLEDTKKALDEQVKSAITEFQNVQPTNEKMTDLQDTKYVVYESVENNE
SMMDTFVKHPIKTGMLNGKKYMVMETTNDDYWKDFMVEGQRVRTISKDAKNNTRTIIFPY
VEGKTLYDAIVKVHVKTIDYDGQYHVRIVDKEAFTKANTDKSNKKEQQDNSAKKEATPAT
PSKPTPSPVEKESQKQDSQKDDNKQLPSVEKENDASSESGKDKTPATKPTKGEVESSSTT
PTKVVSTTQNVAKPTTASSKTTKDVVQTSAGSSEAKDSAPLQKANIKNTNDGHTQSQNNK
NTQENKAKSLPQTGEESNKDMTLPLMALLALSSIVAFVLPRKRKN
G1543
>G1543_STAAU8325, UNDEFINED PRODUCT 1497540:1497668 REVERSE MW:4973
MAVPKRRTSKTRKNKRRTHFKISVPGMTECPNCGRIQIITPCM
G1544
>G1544_STAAU8325, UNDEFINED PRODUCT 1497751:1497846 REVERSE MW:3849
MSLLNSKQQDDSESRQVDPRLQKLQQLYDKEQ
G1456
>NONE, UNDEFINED PRODUCT 1497815:1498165 REVERSE MW:12767
L....QLVIHITGTYTMPCARTLVPVKVPLDVTTTEVFDLEGYNQYNDDQDDVDEHYHII
KDGMVNLQDIVEDIVIIEKPMRAYSEQSDQMLTVGNGWEVIDEDQLDELAKQQATR
LOCUS 50 GB2
>G1392_STAAU8325, UNDEFINED PRODUCT 1343118:1349675 FORWARD MW:238192
DPAAAAVGNGGAPVAITAPYTPTTDPNANNAGQNA
PNEVLSFDDNGIRPSTNRSVPTVNVVNNLPGFTLINGGKVGVFSHAMVRTSMFDSGDNKN
YQAQGNVIALGRIHGTDTNDHGDFNGIEKALTVNPNSELIFEFNTMTTKNGQGATNVIIK
NADTNDTIAEKTVEGGPTLRLFKVPDNVRNLKIQFVPKNDAITDARGIYQLKDGYKYYSF
VDSIGLHSGSHVFVERRTMDPTATNNKEFTVTTSLKNNGNSGASLDTNDFVYQVQLPEGV
EYVNNSLTKDFPSNNSGVDVNDMNVTYDAANRVITIKSTGGGTANSPARLMPDKILDLRY
KLRVNNVPTPRTVTFNETLTYKTYTQDFINSAAESHTVSTNPYTIDIIMNKDALQAEVDR
RIQQADYTFASLDIFNGLKRRAQTILDENRNNVPLNKRVSQAYIDSLTNQMQHTLIRSVD
AENAVNKKVDQMEDLVNQNDELTDEEKQAAIQVIEEHKNEIIGNIGDQTTDDGVTRIKDQ
GIQTLSGDTATPVVKPNAKKAIRDKATKQREIINATPDATEDEIQDALNQLATDETDAID
NVTNATTNADVETAKNNGINTIGAVVPQVTHKKAARDAINQATATKRQQINSNREATQEE
KNAALNELTQATNHALEQINQATTNANVDNAKGDGLNAINPIAPVTVVKQAARDAVSHDA
QQHIAEINANPDATQEERQAAIDKVNAAVTAANTNILNANTNADVEQVKTNAIQGIQAIT
PATKVKTDAKNAIDKSAETQHNTIFNNNDATLEEQQAAQQLLDQAVATAKQNINAADTNQ
EVAQAKDQGTQNIVVIQPATQVKTDTRNVVNDKAREAITNINATTGATREEKQEAINRVN
TLKNRALTDIGVTSTTAMVNSIRDDAVNQIGAVQPHVTKKQTATGVLNDLATAKKQEINQ
NTNATTEEKQVALNQVDQELATAINNINQADTNAEVDQAQQLGTKAINAIQPNIVKKPAA
LAQINQHYNAKLAEINATPDATNDEKNAAINTLNQDRQQAIESIKQANTNAEVDQAATVA
ENNIDAVQVDVVKKQAARDKITAEVAKRIEAVKQTPNATDEEKQAAVNQINQLKDQAINQ
INQNQTNDQVD
LOCUS 50 G10

>G1392_STAAU8325, UNDEFINED PRODUCT 1343118:1349675 FORWARD MW:238192
DQGTQNIVVIQPATQVKTDTRNVVNDKAREAITNINATTGATREEKQEAINRVN
TLKNRALTDIGVTSTTAMVNSIRDDAVNQIGAVQPHVTKKQTATGVLNDLATAKKQEINQ
NTNATTEEKQVALNQVDQELATAINNINQADTNAEVDQAQQLGTKAINAIQPNIVKKPAA
LAQINQHYNAKLAEINATPDATNDEKNAAINTLNQDRQQAIESIKQANTNAEVDQAATVA
ENNID
LOCUS 51 (GC8)
>G2831 FRG_STAAU8325, UNDEFINED PRODUCT 2720353:2721114 FORWARD MW:27865
DPLMLDESLVDIESLSDALMLIESN
>G2832 FRG_STAAU8325, UNDEFINED PRODUCT 2721229:2722446 FORWARD MW:44105
VLRLVEPLKDIDPLNESESLVLVESLIDIESLSEVDSLTLSEPLNDVEVLNEPDVLVEVE
PLVDFESLNESDSLTLSELLSDVDTLNDDESLVLTESLIDCEQLNELDSLTLSDFLNDVE
TLNEPESLTLVEPLIDLESLSELDSLTLSESFTDSDILCESDMLALITSLADVDVLVESL
NDIDTLIEPDVLALVESDVESLTLSDNDVESLILVDVLVESDILCESLVLVRIEVLVEAD
VLRESLVDVDVLADPDALVLLDVLCESLNDVDVESDSLVLSDVEPDSDVLTDVDKLAMVD
MRFEVDVLSESLNDADVLCESDS
>G2837 FRG_STAAU8325, UNDEFINED PRODUCT 2720004:2726816 REVERSE MW:228019
ESDSISESTSTSDSISEAISASESTFISLSESNSTS
DSESQSASAFLSESLSESTSESTSESVSSSTSESTSLSDSTSESGSTSTSLSNSTSGSTS
ISTSTSISESTSTFKSESVSTSLSMSTSTSLSDSTSLSTSLSDSTSDSKSDSLSTSMSTS
DSISTSKSDSISTSTSLSGSTSESESDSTSSSESKSDSTSMSISMSQSTSGSTSTSTSTS
LSDSTSTSLSLSASMNQSGVDSNSASQSASNSTSTSTSESDSQSTSSYTSQSTSQSESTS
TSTSLSDSTSISKSTSQSGSVSTSASLSGSESESDSQSISTSASESTSESASTSLSDSTS
TSNSGSASTSTSLSNSASASESDLSSTSLSDSTSASMQSSESDSQSTSASLSDSLSTSTS
NRMSTIASLSTSVSTSESGSTSESTSESDSTSTSLSDSQSTSRSTSASGSASTSTSTSDS
RSTSASTSTSMRTSTSDSQSMSLSTSTSTSMSDSTSLSDSVSDSTSDSTSASTSGSMSVS
ISLSDSTSTSTSASEVMSASISDSQSMSESVNDSESVSESNSESDSKSMSGSTSVSDSGS
LSVSTSLRKSESVSESSSLSCSQSMSDSVSTSDSSSLSVSTSLRSSESVSESDSLSDSKS
TSGSTSTSTSGSLSTSTSLSGSESVSESTSLSDSISMSDSTSTSDSDSLSGSISLSGSTS
LSTSDSLSDSKSLSSSQSMSGSESTSTSVSDSQSSSTSNSQFDSMSISASESDSMSTSDS
SSISG
LOCUS 52 (E1)
>G0406 FRG_STAAU8325, UNDEFINED PRODUCT 370166:372094 REVERSE MW:70979
MTTTFIISYIILALIIVGVINLFLIRSRKKGKRQQKEQQFTTRQSNQSKFKASDLDKTTD
QSTQRMTHEELRVDNQDDHSQVSLNGYTKGSEKDQEAFTNNKDEEAVAAKNPESEEYKVN
EKIKKEHKNFIFGEGVSRGKILAALLFGMFIAILNQTLLNVALPKINTEFNISASTGQWL
MTGFMLVNGILIPITAYLFNKYSYRKLFLVALVLFTIGSLICAISMNFPIMMVGRVLQAI
GAGVLMPLGSIVIITIYPPEKRGAAMGTMGIAMILAPAIGPTLSGYIVQNYHWNVMFYGM
FIIGIIAILIGFVWFKLYQYTTNPKADIPGIIFSTIGFGALLYGFSEAGNKGWGSVEIET
MFAIGIIFIILFVIRELRMKSPMLNLEVLKFPTFTLTTIINMVVMLSLYGGMILLPIYLQ
NLRGFSALDSGLLLLPGSLIMGLLGPFAGKLLDTIGLKPLAIFGIAVMTYATWELTKLNM
DTPYMTIMGIYVLRSFGMAFIMMPMVTAAINALPGRLASHGNAFLNTMRQLAGSIGTAIL

VTVMTTQTTQHLSAFGEELDKTNP
>G0407 FRG_STAAU8325, UNDEFINED PRODUCT 372110:372754 REVERSE MW:23024
MPQKGTIAKLDGMEGSMVQAGNPIAYAYNLDDLYVTANIDEKDIKDVEVGKDVDVTIDGQKA SIKGKVDSIGKATAASFSLMPSSNSDGNYTKVSQVIPVKITLESEPSKQVVPGMNAEVKIHK N
LOCUS 53 (E20)
>G2244 FRG_STAAU8325, UNDEFINED PRODUCT 2142042:2143301 REVERSE MW:46800
MKLTVVGLGYIGLPTSIMFAKHGVDVLGVDINQQTIDKLQSGQISIEEPGLQEVYEEVLS
SGKLKVSTTPDASDVFIIAVPTPNNDDQYRSCDISLVMRALDSILSFLEKGNTIIVESTI
APKTMDDFVKPVIENLGFTIGEDIYLVHCPERVLPGKILEELVHNNRIIGGVTEACIEAG
KRVYRTFVQGEMIETDARTAEMSKLMENTYRDVNIALANELTKICNNLNINVLDVIEMAN
KHPRVNIHQPGPGVGGHCLAVDPYFIIAKDPENAKLIQTGREINNSMPAYVVDTTKQIIK
VLSGNKVTVFGLTYKGDVDDIRESPAFDIYELLNQEPDIEV
>G2245_STAAU8325, UNDEFINED PRODUCT 2143358:2144242 REVERSE MW:33683
MRKNILITGVHGYIGNALKDKLIEQGHQVDQINVRNQLWKSTSFKDYDVLIHTAALVHNN
SPQARLSDYMQVNMLLTKQLAQKAKAEDVKQFIFMSTMAVYGKEGHVGKSDQVDTQTPMN
PTTNYGISKKFAEQALQELISDSFKVAIVRPPMIYGAHCPGNFQRLMQLSKRLPIIPNIN
NQRSALYIKHLTAFIDQLISLEVTGVYHPQDSFYFDTSSVMYEIRRQSHRKTVLINMPSM
LNKYFNKLSVFRKLFGNLIYSNTLYENNNALEIIPGKMSLVIADIMDETTTKDKA
>G2246_STAAU8325, UNDEFINED PRODUCT 2144245:2144799 REVERSE MW:21063
MKRLFDVVSSIYGLVVLSPILLITALLIKMESPGPAIFKQKRPTINNELFNIYKFRSMKI
DTPNVATDLMDSTSYITKTGKVIRKTSIDELPQLLNVLKGEMSIVGPRPALYNQYELIEK
RTKANVHTIRPGVTGLAQVMGRDDITDDQKVAYDHYYLTHQSMMLDMYIIYKTIKNIVTS
EGVHH
>G2247 FRG_STAAU8325, UNDEFINED PRODUCT 2144813:2146015 REVERSE MW:46577
INTMKYYNLLK
LOCUS 54 (E105)
>G2254 FRG_STAAU8325, UNDEFINED PRODUCT 2152390:2153505 REVERSE MW:42140
MKLKRLFKTSSMTLVKKKLLTMPMAKREIIMFDDKILLI
>G2255_STAAU8325, UNDEFINED PRODUCT 2153408:2155321 REVERSE MW:72361
LLMIKKFLNECHNKIINRKDGLGYKQQMRGFMAHLSVKLRLLILALIDSLIVTFSVFVSY
YILEPYFKTYSVKLLILAAISLFISHHISAFIFNMYHRAWEYASVSELILIVKAVTTSIV
ITMVVVTIVTGNRPFFRLYLITWMMHLILIGGSRLFWRIYRKYLGGKSFNKKPTLVVGAG
QAGSMLIRQMLKSDEMKLEPVLAVDDDEHKRNITITEGVKVQGKIADIPELVRKYKIKKI
IIAIPTIGQERLKEINNICHMDGVELLKMPNIEDVMSGELEVNQLKKVEVEDLLGRDPVE
LDMDMISNELTNKTILVTGAGGSIGSEICRQVCNFYPERIILLGHGENSIYLINRELRNR

FGKNVDIVPIIADVQNRARMFEIMETYKPYAVYHAAAHKHVPLMEDNPEEAVRNNILGTK
NTAEAAKNAEVKKFVMISTDKAVNPPNVMGASKRIAEMIIQSLNDETHRTNFVAVRFGNV
LGSRGSVIPLFKSQIEEGGPVTVTHPEMTRYFMTIPEASRLVLQAGALAEGGEVFVLDMG
EPVKIVDLARNLIKLSGKKEDDIRITYTGIRPGEKMFEELMNKDEVHPEQVFEKIYRGKV
QHMKCNEVEAIIQDIVNDFSKEKIINYANGKKGDNYVR
>G2256_STAAU8325, UNDEFINED PRODUCT 2155251:2156012 REVERSE MW:29362
DQLFFELQSKGFVPIIAHPERNKAISQNLDILYDLINKGALSQVTTASLAGISGKKIRKLAI
QMIENNLTHFIGSDAHNTEIRPFLMKDLFNDKKLRDYYEDMNGFISNAKLVVDDKKIPKR
MPQQDYKQKRWFGL
LOCUS 55 (E18)
>G2912 FRG_STAAU8325, UNDEFINED PRODUCT 2797518:2798504 FORWARD MW:37832
SKSYDERFTPDEVVAYQQHQGNKFKEHFDLNCYLTLLDVLDSHNIDRGRTDVTHVFKNLETK
VLTMGFIDDLLYPDD
LOCUS 56 (F5)
>G1261 FRG_STAAU8325, UNDEFINED PRODUCT 1216923:1217903 FORWARD MW:36061
HTGKVLLVTEDNLEGSIMSEVSAIIAEHCLFDLDAPIMRLAAPDVPSM
PFSPVLENEIMMNPEKILNKMRELAEF
>G1262_STAAU8325, UNDEFINED PRODUCT 1217919:1219190 FORWARD MW:46726
MEITMPKLGESVHEGTIEQWLVSVGDHIDEYEPLCEVITDKVTAEVPSTISGTITEILVE
AGQTVAIDTIICKIETADEKTNETTEEIQAKVDEHTQKSTKKASATVEQTSTAKQNQPRN
NGRFSPVVFKLASEHDIDLSQVVGSGFEGRVTKKDIMSVIENGGTTAQSDKQVQTKSTSV
DTSSNQSSEDNSENSTIPVNGVRKAIAQNMVNSVTEIPHAWMMIEVDATNLVNTRNHYKN
SFKNKEGYNLTFFAFFVKAVADALKAYPLLNSSWQGNEIVLHKDINISIAVADENKLYVP
VIKHADEKSIKGIAREINTLATKARNKQLTAEDMQGGTFTVNNTGTFGSVSSMGIINHPQ
AAILQVESIVKKPVVINDMIAIRNMVNLCISIDHRILDGLQTGKFMNHIKQRIEQYTLEN
TNIY
>G1263_STAAU8325, UNDEFINED PRODUCT 1219532:1219978 FORWARD MW:16676
VIELMDMNFDLYMNGVVEQARNEIESAGYEQLTTAEDVDKVLKQDGTTLVMINSVCGCAG
GIARPAASHALHYDVLPDRLVTVFAGQDKEATQRAREYFEGYAPSSPSFALVKDGKITEM
IERHQIEGHDVMNVINQLQTLFNKYCEER
>G1264_STAAU8325, UNDEFINED PRODUCT 1219995:1220972 FORWARD MW:36973
MLKLNPYKIGFRTIKTAVGMTLGVIISKLLGLDNYASSAILVVLCIKHTKVHSLQAIISR
LVSCFLVLFLGSAIFSLLGQSPIVLGIIVLLFIPLTVVLKVQEGVITSCVILLHVFNAKS
IDAHLIVNETLLLLIGLSIAFTMNLMMPSLDKQLDEYKCKIEQQIADIFSKYSYICEKYE
DTIAIEFEVLLLNIKKAKSIAFRDVKNHFVRNENSYYHYFDMREEQVELLMRMKPLIESI
CHKD
LOCUS 57 (F3)

>G0451_STAAU8325, UNDEFINED PRODUCT 410768:412549 FORWARD MW:67976
DLRVLMDAIYELNDHQDLREITKDSKMQKLALAGFLKKIKGTYIESLLKEHKLL
>G0452_STAAU8325, UNDEFINED PRODUCT 412872:414536 FORWARD MW:60909
MEMSVTEVIFSFLGGLGIFLYGLKIMGDGLQASAGDRLRDILNKFTSNPVLGVIAGIVVT
ILIQSSSGTTVITIGLVTAGFMTLKQAIGVIMGANIGTTVTAFIIGIDLGEYAMPILALG
AFLIFFFKRSKINNIGRILFGFGSLFFGLEFMGDAVKPLASLDGFKQLMLDMSTNPILAV
IVGAGLTALVQSSSATIGILQEFYQQDLISLNAAIPVLLGDNIGTTITAILASLAGSIAA
KRAALVHVIFNLIGVIIFTIFLPVVIHLISLLQDLWHLKPAMTIAVSHGIFNITNTLIQL
PFVAGLAWIVTKLVPGKDIADDYKPQHL
LOCUS 58 (G8)
>G0922 FRG_STAAU8325, UNDEFINED PRODUCT 915062:915931 REVERSE MW:33411
MPELPEVEHVKRGIEPYVINQKIEHVIFSDKVIEGKAQGKETIIKGIELDTFKTLSEGYT
ITNVERRSKYIVFQLDNKREQRTLISHLGMAGGFFIVDELEDIMIPNYRKHWHVIFELSN
DKKLIYSDIRRFGEIRNVASVASYPSFLEIAPEPFSNEALTYYLNRIHQQSNKNKPIKQV
IL
>G0923_FRG STAAU8325, UNDEFINED PRODUCT 915950:918577 REVERSE MW:99163
DELIFEVPKSEVDSFSEFVEEIMENALQLDVPLKVDSSYGATWYDAK
LOCUS 59 (G23)
>G2454 FRG_STAAU8325, UNDEFINED PRODUCT 2344101:2344937 REVERSE MW:32360
MLNEIQILNNGYPMPSVGLGVYKISDEDMTKVVNAAIDAGYRAFDTAYFYDNEASLGRAL
KDNGVDREDLFITTKLWNDYQGYEKTFEYFNKSIENLQTDYLDLFLIHWPCEADGLFLET
YKAMEELYEQGKVKAIGVCNFNVHHLEKLMAQSSIKPMVNQIEVHPYFNQQELQ
>G2455_STAAU8325, UNDEFINED PRODUCT 2345162:2346508 REVERSE MW:51133
LETSTIISLIIFILLIALTTVFVGSEFALVKIRATRIEQLADEGNKPAKIVKKMIANLDY
YLSACQLGITVTSLGLGWLGEPTFEKLLHPIFEAINLPTALTTTISFAVSFIIVTYLHVV
LGELAPKSIAIQHTEKLALVYARPLFYFGNIMKPLIWLMNGSARVIIRMFGVNPDAQTDA
MSEEEIKIIINNSYNGGEINQTELAYMQNIFSFDERHAKDIMVPRTQMITLNEPFNVDEL
LETIKEHQFTRYPITDDGDKDHIKGFINVKEFLTEYASGKTIKIANYIHELPMISETTRI
SDALIRMQREHVHMSLIIDEYGGTAGILTMEDILEEIVGEIRDEFDDDEVNDIVKIDNKT
FQVNGRVLLDDLTEEFGIEFDDSEDIDTIGGWLQSRNTNLQKDDYVDTTYDRWVVSEIDN
HQIIWVILNYEFNEARPTIGQSDEDEKSE
LOCUS 60 (G29)
>G0139_FRG STAAU8325, UNDEFINED PRODUCT 137065:137352 REVERSE MW:11080
VMNLAKFSRIKKAGETMATWVAIIFIVAALILGLIGGFLLARKYMMDYLKKNPPINEEML
RMMMMQMGQKPSQK

>NONE, UNDEFINED PRODUCT 137582:139645 REVERSE MW:75349
VFYLSFYFKISYNVFDKIEEGKIHKMFNEKDQLAVDTLRALSIDTIEKANSGHPGLPMGA
APMAYTLWTRHLNFNPQSKDYFNRDRFVLSAGHGSALLYSLLHVSGSLELEELKQFRQWG
SKTPGHPEYRHTDGVEVTTGPLGQGFAMSVGLALAEDHLAGKFNKEGYNVVDHYTYVLAS
DGDLMEGISHEAASFAGHNKLSKLVVLYDSNDISLDGELNKAFSENTKARFEAYGWNYLL
VKDGNDLEEIDKAITTAKSQEGPTIIEVKTTIGFGSPNKAGTNGVHGAPLGEVERKLTFE
NYGLDPEKRFNVSEEVYEIFQNTMLKRANEDESQWNSLLEKYAETYPELAEEFKLAISGK
LPKNYKDELPRFELGHNGASRADSGTVIQAISKTVPSFFGGSADLAGSNKSNVNDATDYS
SETPEGKNVWFGVREFAMGAAVNGMAAHGGLHPYGATFFVFSDYLKPALRLSSIMGLNAT
FIFTHDSIAVGEDGPTHEPIEQLAGLRAIPNMNVIRPADGNETRVAWEVALESESTPTSL
VLTRQNLPVLDVPEDVVEEGVRKGAYTVYGSEETPEFLLLASGSEVSLAVEAAKDLEKQG
KSVRVVSMPNWNAFEQQSEEYKESVIPSSVTKRVAIEMASPLGWHKYVGTAGKVIAIDGF
GASAPGDLVVEKYGFTKENILNQVMSL
LOCUS 61 (G28/HA7)
>G2610_FRG STAAU8325, UNDEFINED PRODUCT 2494989:2495441 FORWARD MW:17293
DLGMDKDEAKKLFAKSESIFKDLKGVKYKVDYKDKKAIEHLDIDYTEVDMKKLNKRLGV
STKENKDISFEKLEKQLKHRGLKEKDKMDDK
>G2611_STAAU8325, UNDEFINED PRODUCT 2495615:2497207 REVERSE MW:58937
LGGGIVMTFLTVMQFIVNIIVVGFMLTVIVIGLIWLIKDKRQSQHSVLRNYPLLARIRYI
SEKMGPELRQYLFSGDNEGKPFSRNDYKNIVLAGKYNSRMTSFGTTKDYQDGFYIQNTMF
PMQRNEISVDNTTLLSTFIYKIANERLFSREEYRVPTKIDPYYLSDDHAIKLGEHLKHPF
ILKRIVGQSGMSYGALGKNAITALSKGLAKAGTWMNTGEGGLSEYHLKGNGDIIFQIGPG
LFGVRDKEGNFSEGLFKEVAQLSNVRAFELKLAQGAKTRGGHMEAEKVNEEIAKIRNVEP
YKTINSPNRYEFIHNAEDLIRFVDQLQQLGQKPVGFKIVVSKVSEIETLVRTMVELDKYP
SFITIDGGEGGTGATFQELQDGVGLPLFTALPIVSGMLEKYGIRDKVKLAASGKLVTPDK
IAIALGLGADFVNIARGMMISVGCIMSQQCHMNTCPVGVATTDAKKEKALIVGEKQYRVT
NYVTSLHEGLFNIAAAVGVSSPTEITADHIVYRKVDGELQTIHDYKLKLIS
LOCUS 62 (H3)
>G2004_STAAU8325, UNDEFINED PRODUCT 1871545:1872954 REVERSE MW:51401
MGIGRVTQVMGPVIDVRFEHNEVPKINNALVIDVPKEEGTIQLTLEVALQLGDDVVRTIA
MDSTDGVQRGMDVKDTGKEISVPVGDETLGRVFNVLGETIDLKEEISDSVRRDPIHRQAP
AFDELSTEVQILETGIKVVDLLAPYIKGGKIGLFGGAGVGKTVLIQELINNIAQEHGGIS
VFAGVGERTREGNDLYFEMSDSGVIKKTAMVFGQMNEPPGARMRVALSGLTMAEYFRDEQ
GQDVLLFIDNIFRFTQAGSEVSALLGRMPSAVGYQPTLATEMGQLQERITSTTKG
LOCUS 63 (GD10)
>G2900_FRG STAAU8325, UNDEFINED PRODUCT 2781950:2783308 FORWARD MW:51966
DPIFKQEVENLEKEIRNV
>G2901_STAAU8325, UNDEFINED PRODUCT 2783589:2784719 FORWARD MW:41914

MMEFTIKRDYFITQLNDTLKAISPRTTLPILTGIKIDAKEHEVILTGSDSEISIEITIPK
TVDGEDIVNISETGSVVLPGRFFVDIIKKLPGKDVKLSTNEQFQTLITSGHSEFNLSGLD
PDQYPLLPQVSRDDAIQLSVKVLKNVIAQTNFAVSTSETRPVLTGVNWLIQENELICTAT
DSHRLAVRKLQLEDVSENKNVIIPGKALAELNKIMSDNEEDIDIFFASNQVLFKVGNVNF
ISRLLEGHYPDTTRLFPENYEIKLSIDNGEFY
LOCUS 64 (F5)
>G1261 FRG_STAAU8325, UNDEFINED PRODUCT 1216923:1217903 FORWARD MW:36061
HTGKVLLVTEDNLEGSIMSEVSAIIAEHCLFDLDAPIMRLAAPDVPSM
PFSPVLENEIMMNPEKILNKMRELAEF
>G1262_STAAU8325, UNDEFINED PRODUCT 1217919:1219190 FORWARD MW:46726
MEITMPKLGESVHEGTIEQWLVSVGDHIDEYEPLCEVITDKVTAEVPSTISGTITEILVE
AGQTVAIDTIICKIETADEKTNETTEEIQAKVDEHTQKSTKKASATVEQTSTAKQNQPRN
NGRFSPVVFKLASEHDIDLSQVVGSGFEGRVTKKDIMSVIENGGTTAQSDKQVQTKSTSV
DTSSNQSSEDNSENSTIPVNGVRKAIAQNMVNSVTEIPHAWMMIEVDATNLVNTRNHYKN
SFKNKEGYNLTFFAFFVKAVADALKAYPLLNSSWQGNEIVLHKDINISIAVADENKLYVP
VIKHADEKSIKGIAREINTLATKARNKQLTAEDMQGGTFTVNNTGTFGSVSSMGIINHPQ
AAILQVESIVKKPVVINDMIAIRNMVNLCISIDHRILDGLQTGKFMNHIKQRIEQYTLEN
TNIY
>G1263_STAAU8325, UNDEFINED PRODUCT 1219532:1219978 FORWARD MW:16676
VIELMDMNFDLYMNGVVEQARNEIESAGYEQLTTAEDVDKVLKQDGTTLVMINSVCGCAG
GIARPAASHALHYDVLPDRLVTVFAGQDKEATQRAREYFEGYAPSSPSFALVKDGKITEM
IERHQIEGHDVMNVINQLQTLFNKYCEER
>G1264_STAAU8325, UNDEFINED PRODUCT 1219995:1220972 FORWARD MW:36973
MLKLNPYKIGFRTIKTAVGMTLGVIISKLLGLDNYASSAILVVLCIKHTKVHSLQAIISR
LVSCFLVLFLGSAIFSLLGQSPIVLGIIVLLFIPLTVVLKVQEGVITSCVILLHVFNAKS
IDAHLIVNETLLLLIGLSIAFTMNLMMPSLDKQLDEYKCKIEQQIADIFSKYSYICEKYE
DTIAIEFEVLLLNIKKAKSIAFRDVKNHFVRNENSYYHYFDMREEQVELLMRMKPLIESI
CHKD
LOCUS 65 (F110)
>G2848_STAAU8325, UNDEFINED PRODUCT 2734525:2735082 REVERSE MW:21969
LKDKIIDNAITLFSEKGYDGTTLDDIAKSVNIKKASLYYHFDSKKSIYEQSVKCCFDYLN
NIIMMNQNKSNYSIDALYQFLFEFIFDIEERYIRMYVQLSNTPEEFSGNIYGQIQDLNQS
LSKEIAKFYDESKIKMTKEDFQNLILLFLESWYLKASFSQKFGAVEESKSQFKDEVYSLL
NIFLKK
>G2849_STAAU8325, UNDEFINED PRODUCT 2735246:2736481 FORWARD MW:47752
LQFFNFLLFYPVFMSIYWIVGSIYFYFTREIRYSLNKKPDINVDELEGITFLLACYNESE
TIEDTLSNVLALKYEKKEIIIINDGSSDNTAELIYKIKENNDFIFVDLQENRGKANALNQ
GIKQASYDYVMCLDADTIVDQDAPYYMIENFKHDPKLGAVTGNPRIRNKSSILGKIQTIE
YASLIGCIKRSQTLAGAVNTISGVFTLFKKSAVVDVGYWDTDMITEDIAVSWKLHLRGYR

IKYEPLAMCWMLVPETLGGLWKQRVRWAQGGHEVLLRDFFSTMKTKRFPLYILMFEQIIS
ILWVYIVLLYLGYLFITANFLDYTFMTYSFSIFLLSSFTMTFINVIQFTVALFIDSRYEK
KNMAGLIFVSWYPTVYWIINAAVVLVAFPKALKRKKGGYATWSSPDRGNTQR
>G2850_STAAU8325, UNDEFINED PRODUCT 2736448:2736750 FORWARD MW:11783
MVKPRQREYPTLKSSLNIVRETALIAISCVFWIYCLVVLLVYIGTIFEIHDESINTIRVA
LNIENTEILDIFETMGIFAIIIFVFFTISILIQKWQRGRES
>G2851_STAAU8325, UNDEFINED PRODUCT 2736729:2737619 FORWARD MW:34958
MAERKRIVKYRKFIILVLSILIILPVSTLDGHHIANADDDSPKKLKYKENSALALNYHRV
RKANFLNNFIYFFSSSKEIKNYSVSQSQFESQIKWLKSHDAKFLTLKEFLYYKKKGKFPK
RSVWINFDDMDETIYENAYPILKKYKIPATGFIITGHVGEENFHNLDMISKKELKEMYKT
GLWEFETHTHDLHNLSKNNKSKLMKASEATIIKDLNKSEKYLTKNFKKSQKTIAYPYGLM
NDDKLPVIKKAGLKYGFSLEEKAVTPNSNDYYIPRILISDDAFEHLIKRWDGFHEKD
>G2852_STAAU8325, UNDEFINED PRODUCT 2737609:2738658 FORWARD MW:41344
MKKIRLELVYLRAIICAIIIITHLLTQITLKHENMEGGSLVLQFYIRNIVIFGTPCFIIL
SQLLTTLNYQKVTYRYLTTRVKYILIPYILMGLFYSYSESLLTDSSFNKQFIENVLLGQW
YGYFIVVIMQFFILSYIIFKINYNLFNSKILLLLSFILQQSFLYYFTNNTAFHDTVLHYY
PLSENTIIFGWIFYFFLGAYMGYNYERVLNFLERYLVIMIVLAVATYFVFIALANGDYWN
VTSFSYSLTPYNSIMFIVILGICTHFKTMLFNTIQMISAFSFFIYLLHPIILDSLFAYTN
IFEDNTMVFLAISLLFILGLCIGVGMILREFYIFRFIIGKQPYKLNINAY
>G2853_FRG STAAU8325, UNDEFINED PRODUCT 2739111:2741162 REVERSE MW:77120
DPIVLVHGFNGFTDDINPSVLAHYWGGNKMNIRQDLEENGYKAYEASISAFGSNYD
RAVELYYYIKGGRVDYGAAHAAKYGHERYGKTYEGIYKDWKPGQKVHLVGHSMGGQTIRQ
LEELLRNGNREEIEYQKKHGGEISPLFKGNHDNMISSITTLGTPHNGTHASDLAGNEALV
RQIVFDIGKMFGNKNSRVDFGLAQWGLKQKPNESYIDYVKRVKQSNLWKSKDNGFYDLTR
EGATDLNRKTSLNPNIVYKTYTGEATHKALNSDRQKADLNMFFPFVITGNLIGKATEKEW
RENDGLVSVISSQHPFNQAYTKATDKIQKGIWQVTPTKHDWDHVDFVGQDSSDTVRTREE
LQDFWHHLADDLVKTEKLTDTKQA
LOCUS 66 (E1)
>G0406_STAAU8325, UNDEFINED PRODUCT 370166:372094 REVERSE MW:70979
MTTTFIISYIILALIIVGVINLFLIRSRKKGKRQQKEQQFTTRQSNQSKFKASDLDKTTD
QSTQRMTHEELRVDNQDDHSQVSLNGYTKGSEKDQEAFTNNKDEEAVAAKNPESEEYKVN
EKIKKEHKNFIFGEGVSRGKILAALLFGMFIAILNQTLLNVALPKINTEFNISASTGQWL
MTGFMLVNGILIPITAYLFNKYSYRKLFLVALVLFTIGSLICAISMNFPIMMVGRVLQAI
GAGVLMPLGSIVIITIYPPEKRGAAMGTMGIAMILAPAIGPTLSGYIVQNYHWNVMFYGM
FIIGIIAILIGFVWFKLYQYTTNPKADIPGIIFSTIGFGALLYGFSEAGNKGWGSVEIET
MFAIGIIFIILFVIRELRMKSPMLNLEVLKFPTFTLTTIINMVVMLSLYGGMILLPIYLQ
NLRGFSALDSGLLLLPGSLIMGLLGPFAGKLLDTIGLKPLAIFGIAVMTYATWELTKLNM
DTPYMTIMGIYVLRSFGMAFIMMPMVTAAINALPGRLASHGNAFLNTMRQLAGSIGTAIL
VTVMTTQTTQHLSAFGEELDKTNP
>G0407_STAAU8325, UNDEFINED PRODUCT 372110:372754 REVERSE MW:23024
MPQKGTIAKLDGMEGSMVQAGNPIAYAYNL

DDLYVTANIDEKDIKDVEVGKDVDVTIDGQKASIKGKVDSIGKATAASFSLMPSSNSDGN
YTKVSQVIPVKITLESEPSKQVVPGMNAEVKIHKN
LOCUS 67 (F119)
>G1831 FRG_STAAU8325, UNDEFINED PRODUCT 1723090:1723806 REVERSE MW:27770
MEHTTMKMTAIAKASLALGILATGTITSLHQTVNASEHKAKYENVTKDIFDLRDYYSGAS
KELKNVTGYRYSKGGKHYLIFDKNRKFTRVQIFGKDIERFKARKNPGLDIFVVKEAENRN
GTVFSYGGVTKKNQDAYYDYINAPRFQIKRDEGDGIATYGRVHYIYKEEISLKELDFKLR
QYLIQNF
>G1832_STAAU8325, UNDEFINED PRODUCT 1724158:1725096 REVERSE MW:34671
MEHTTMKITTIAKTSLALGLLTTGVITTTTQAANATTLSSTKVEAPQSTPPSTKIEAPQS
KPNATTPPSTKVEAPQQTANATTPPSTKVTTPPSTNTPQPMQSTKSDTPQSPTTKQVPTE
INPKFKDLRAYYTKPSLEFKNEIGIILKKWTTIRFMNVVPDYFIYKIALVGKDDKKYGEG
VHRNVDVFVVLEENNYNLEKYSVGGITKSNSKKVDHKAGVRITKEDNKGTISHDVSEFKI
TKEQISLKELDFKLRKQLIEKNNLYGNVGSGKIVIKMKNGGKYTFELHKKLQENRMADVI
DGTNIDNIEVNIK
>G1834_STAAU8325, UNDEFINED PRODUCT 1725193:1725327 REVERSE MW:5264
LFVKVAFLCLKSDETSNVPSVESHQNHFYLTNIMDFLIYLTMIQI
>G1835_STAAU8325, UNDEFINED PRODUCT 1725449:1726531 REVERSE MW:40775
LEHTIMKMRTIAKTSLALGLLTTGAITVTTQSVKAEKIQSTKVDKVPTLKAERLAMINIT
AGANSATTQAANTRQERTPKLEKAPNTNEEKTSASKIEKISQPKQEEQKTLNISATPAPK
QEQSQTTTESTTPKTKVTTPPSTNTPQPMQSTKSDTPQSPTIKQAQTDMTPKYEDLRAYY
TKPSFEFEKQFGFMLKPWTTVRFMNVIPNRFIYKIALVGKDEKKYKDGPYDNIDVFIVLE
DNKYQLKKYSVGGITKTNSKKVNHKVELSITKKDNQGMISRDVSEYMITKEEISLKELDF
KLRKQLIEKHNLYGNMGSGTIVIKMKNGGKYTFELHKKLQEHRMADVIDGTNIDNIEVNI
K
>G1837_STAAU8325, UNDEFINED PRODUCT 1726810:1727562 REVERSE MW:28926
DYDFFPFKIDKEAMSLKEIDFKLRKYLIDNYGLYGEMSTGKITVKKKYYGKYTFELDKKLQE DRMSDVINVTD
IDRIEIKVIKA
LOCUS 68 (G27)
>G0516_STAAU8325, UNDEFINED PRODUCT 482272:486597 REVERSE MW:163057
VVIVLAMTEQQKFKVLADQIKISNQLDAEILNSGELTRIDVSNKNRTWEFHITLPQFLAH
EDYLLFINAIEQEFKDIANVTCRFTVTNGTNQDEHAIKYFGHCIDQTALSPKVKGQLKQK
KLIMSGKVLKVMVSNDIERNHFDKACNGSLIKAFRNCGFDIDKIIFETNDNDQEQNLASL
EAHIQEEDEQSARLATEKLEKMKAEKAKQQDNNESAVDKCQIGKPIQIENIKPIESIIEE
EFKVAIEGVIFDINLKELKSGRHIVEIKVTDYTDSLVLKMFTRKNKDDLEHFKALSVGKW
VRAQGRIEEDTFIRDLVMMMSDIEEIKKATKKDKAEEKRVEFHLHTAMSQMDGIPNIGAY
VKQAADWGHPAIAVTDHNVVQAFPDAHAAAEKHGIKMIYGMEGMLVDDGVPIAYKPQDVV
LKDATYVVFDVETTGLSNQYDKIIELAAVKVHNGEIIDKFERFSNPHERLSETIINLTHI

TDDMLVDAPEIEEVLTEFKEWVGDAIFVAHNASFDMGFIDTGYERLGFGPSTNGVIDTLE
LSRTINTEYGKHGLNFLAKKYGVELTQHHRAIYDTEATAYIFIKMVQQMKELGVLNHNEI
NKKLSNEDAYKRARPSHVTLIVQNQQGLKNLFKIVSASLVKYFYRTPRIPRSLLDEYREG
LLVGTACDEGELFTAVMQKDQSQVEKIAKYYDFIEIQPPALYQDLIDRELIRDTETLHEI
YQRLIHAGDTAGIPVIATGNAHYLFEHDGIARKILIASQPGNPLNRSTLPEAHFRTTDEM
LNEFHFLGEEKAHEIVVKNTNELAD
LOCUS 69 (H110)
>G2217 FRG_STAAU8325, UNDEFINED PRODUCT 2108154:2110211 FORWARD MW:74420
DPASGYASILGIPTLQTGVFGGIIIGALAAWCYNKFYNINLPSYLGFFAGKRFVPIMM
ATTSFILAFPMALIWPTIQSGLNAFSTGLLDSNTGVAVFLFGFIKRLLIPFGLHHIFHAP
FWFEFGSWKNAAGEIIHGDQRIFIEQIREGAHLTAGKFMQGEFPVMMFGLPAAALAIYHT
AKPENKKVVAGLMGSAALTSFLTGITEPLEFSFLFVAPLLFFIHAVLDGLSFLTLYLLDL
HLGYTFSGGFIDYFLLGILPNKTQWWLVIPVGLVYAVIYYFVFRFLIVKLKYKTPGREDK
QSQAATASATELPYAVLEAMGGKANIKHLDACITRLRVEVNDKSKVDVPGLKDLGASGVL
EVGNNMQAIFGPKSDQIKHEMQQIMNGQVVENPTTMEDDKDETVVVAEDKSATSELSHIV
HAPLTGEVTPLSEVPDQVFSEKMMGDGIAIKPSQGEVRAPFNGKVQMIFPTKHAIGLVSD
SGLELLIHIGLDTVKLNGEGFTLHVEEGQEVKQGDLLINFDLDYIRNHAKSDITPIIVTQ
GNITNLDFKQGEHGNISFGDQLFEAK
LOCUS 70
>G1778_STAAU8325, UNDEFINED PRODUCT 1669401:1669715 REVERSE MW:11597
MRGGGNMQQMMKQMQKMQKKMAQEQEKLKEERIVGTAGGGMVAVTVTGHKEVVDVEIKEE
AVDPDDIEMLQDLVLAATNEAMNKADELTQERLGKHTQG
>G1780_STAAU8325, UNDEFINED PRODUCT 1669808:1671502 REVERSE MW:63481
LNYQALYRMYRPQSFEDVVGQEHVTKTLRNAISKEKQSHAYIFSGPRGTGKTSIAKVFAK
AINCLNSTDGEPCNECHICKGITQGTNSDVIEIDAASNNGVDEIRNIRDKVKYAPSESKY
KVYIIDEVHMLTTGAFNALLKTLEEPPAHAIFILATTEPHKIPPTIISRAQRFDFKAISL
DQIVERLKFVADAQQIECEDEALAFIAKASEGGMRDALSIMDQAIAFGDGTLTLQDALNV
TGSVHDEALDHLFDDIVQGDVQASFKKYHQFITEGKEVNRLINDMIYFVRDTIMNKTSEK
DTEYRALMNLELDMLYQMIDLINDTLVSIRFSVNQNVHFEVLLVKLAEQIKGQPQVIANV
AEPAQIASSPNTDVLLQRMEQLEQELKTLKAQGVSVAPVQKSSKKPARGIQKSKNAFSMQ
QIAKVLDKANKADIKLLKDHWQEVIDHAKNNDKKSLVSLLQNSEPVAASEDHVLVKFEEE
IHCEIVNKDDEKRSSIESVVCNIVNKNVKVVGVPSDQWQRVRTEYLQNRKNEGDDMPKQQ
AQQTDIAQKAKDLFGEETVHVIDEE
>G1781_STAAU8325, UNDEFINED PRODUCT 1671574:1672095 REVERSE MW:19908
MQIYLSTLTELDYDKSLNSIEESFDDNPETSWQARAKVKHLRKSPCYNFELEVIAKNENN
DVVGHVLLIEVEINSDDKTYYGLAIASLSVHPELRGQKLGRGLVQAVEERAKAQEYSTVV
VDHCFDYFEKLGYQNAAEHDIKLESGDAPLLVKYLWDNLTDAPHGIVKFPEHFY
>G1782_STAAU8325, UNDEFINED PRODUCT 1672236:1672334 REVERSE MW:3948
LKTIQRIIRGTCLWEVAFLYVKFDSSELDVQFE

>G1783_STAAU8325, UNDEFINED PRODUCT 1672737:1673480 REVERSE MW:28585
IGNDVASDSIYDYLEKVLNL
NISYSSKSITFEPFDEQAYQLFGDVSVAYSATVRSIVYLENTMPFQYNISKHLANEFKFN
DFSRRRIK
LOCUS 71
>G1083_STAAU8325, UNDEFINED PRODUCT 1057165:1058778 REVERSE MW:57664
DREKLQERLAKLAGGVAVIKVGAASETELKERKLRIEDALNSTRAAVEEGIVAGGGTALVNV
YQKVSEIEAEGDIETGVNIVLKALTAPVRQIAENAGLEGSVIVERLKNAEPGVGFNAATN
EWVNMLE
LOCUS 72
>G2296_STAAU8325, UNDEFINED PRODUCT 2195143:2196150 REVERSE MW:37749
MNREMLYLNRSDIEQAGGNHSQVYVDALTEALTAHAHNDFVQPLKPYLRQDPENGHIADR
IIAMPSHIGGEHAISGIKWIGSKHDNPSKRNMERASGVIILNDPETNYPIAVMEASLISS
MRTAAVSVIAAKHLAKKGFKDLTIIGCGLIGDKQLQSMLEQFDHIERVFVYDQFSEACAR
FVDRWQQQRPEINFIATENAKEAVSNGEVVITCTVTDQPYIEYDWLQKGAFI
>G2297_STAAU8325, UNDEFINED PRODUCT 2196150:2197127 REVERSE MW:35879
LIEKSQACHDSLLDSVGQTPMVQLHQLFPKHEVFAKLEYMNPGGSMKDRPAKYIIEHGIK
HGLITENTHLIESTSGNLGIALAMIAKIKGLKLTCVVDPKISPTNLKIIKSYGANVEMVE
EPDAHGGYLMTRIAKVQELLATIDDAYWINQYANELNWQSHYHGAGTEIVETIKQPIDYF
VAPVSTTGSIMGMSRKIKEVHPNAQIVAVDAKGSVIFGDKPINRELPGIGASRVPEILNR
SEINQVIHVDDYQSALGCRKLIDYEGIFAGGSTGSIIAAIEQLITSIEEGATIVTILPDR
GDRYLDLVYSDTWLEKMKSRQGVKSE
LOCUS 73
>G2599_STAAU8325, UNDEFINED PRODUCT 2484215:2486668 REVERSE MW:91038
DPVIGRDKEITRVIEVLSRRTKNNPVLIGEPGVGKTAIAEGLAQAIVNNEVPETLKDKRVM
SLDMGTVVAGTKYRGEFEERLKKVMEEIQQAGNVILFIDELHTLVGAGGAEGAIDASNIL
KPALARGELQCIGATTLDEYRKNIEKDAALERRFQPVQVDEPSVVDTVAILKGLRDRYEA
HHRINISDEAIEAAVKLSNRYVSDRFLPDKAIDLIDEASSKVRLKSHTTPNNLKEIEQEI
EKVKNEKDAAVHAQEFENAANLRDKQTKLEKQYEEAKNEWKNAQNGMSTSLSEEDIAEVI
AGWTGIPLTKINETESEKLLSLEDTLHERVIGQKDAVNSISKAVRRARAGLKDPKRPIGS
FIFLGPTGVGKTELARALAESMFGDDDAMIRVDMSEFMEKHAVSRLVGAPPGYVGHDDGG
QLTEKVRRKPYSVILFDEIEKAHPDVFNILLQVLDDGHLTDTKGRTVDFRNTIIIMTSNV
GAQELQD
LOCUS 74
>G1438_STAAU8325, UNDEFINED PRODUCT 1399373:1401364 REVERSE MW:74364
MIGKIINERYKIVDKLGGGGMSTVYLAEDTILNIKVAIKAIFIPPREKEETLKRFEREVH
NSSQLSHQNIVSMIDVDEEDDCYYLVMEYIEGPTLSEYIESHGPLSVDTAINFTNQILDG
IKHAHDMRIVHRDIKPQNILIDSNKTLKIFDFGIAKALSETSLTQTNHVLGTVQYFSPEQ

AKGEATDECTDIYSIGIVLYEMLVGEPPFNGETAVSIAIKHIQDSVPNVTTDVRKDIPQS
LSNVILRATEKDKANRYKTIQEMKDDLSSVLHENRANEDVYELDKMKTIAVPLKKEDLAK
HISEHKSNQPKRETTQVPIVNGPAHHQQFQKPEGTVYEPKPKKKSTRKIVLLSLIFSLLM
IALVSFVAMAMFGNKYEETPDVIGKSVKEAEQIFNKNNLKLGKISRSYSDKYPENEIIKT
TPNTGERVERGDSVDVVISKGPEKVKMPNVIGLPKEEALQKLKSLGLKDVTIEKVYNNQA
PKGYIANQSVTANTEIAIHDSNIKLYESLGIKQVYVEDFEHKSFSKAKKALEEKGFKVES
KEEYSDDIDEGDVISQSPKGKSVDEGSTISFVVSKGKKSDSSDVKTTTESVDVPYTGKND
KSQKVKVYIKDKDNDGSTEKGSFDITSDQRIDIPLRIEKGKTASYIVKVDGKTVAEKEVS
YDDV
>G1439_STAAU8325, UNDEFINED PRODUCT 1401364:1402104 REVERSE MW:28046
DQLMQLALDNHSKDNVTFILA
AIEGDKV
LOCUS 75
>G0364_STAAU8325, UNDEFINED PRODUCT 331693:334395 REVERSE MW:98970
MAANFKEQSKKHFDLNGQSYTYYDLKAVEEQGITKVSNLPYSIRVLLESLLRQEDDFVIT
DDHIKALSQFGKDGNEGEVPFKPSRVILQDFTGVPAVVDLASLRKAMDDVGGDITKINPE
VPVDLVIDHSVQVDSYANPEALERNMKLEFERNYERYQFLNWATKAFDNYNAVPPATGIV
HQVNLEYLASVVHVRDVDGEKTAFPDTLVGTDSHTTMINGIGVLGWGVGGIEAEAGMLGQ
PSYFPIPEVIGVRLVNSLPQGATATDLALRVTQELRKKGVVGKFVEFFGPGVQHLPLADR
ATIANMAPEYGATCGFFPVDDESLKYMKLTGRSDEHIALVKEYLKQNHMFFDVEKEDPNY
TDVIELDLSTVEASLSGPKRPQDLIFLSDMKSSFENSVTAPAGNQGHGLDKSEFDKKAEI
NFKDGSKATMKTGDIAIAAITSCTNTSNPYVMLGAGLVAKKAVEKGLKVPEYVKTSLAPG
SKVVTGYLRDAGLQPYLDDLGFNLVGYGCTTCIGNSG
LOCUS 76
>G2434_STAAU8325, UNDEFINED PRODUCT 2324870:2325844 REVERSE MW:37506
VIKFKNVTKRYGKHVAVDNISFNINEGEFFVLIGPSGCGKTTTLKMINRLIHLSEGYIYF
KDKPISDYPVYEMRWDIGYVLQQIALFPHMTIKENIAQVPQMKKWKEKDIDKRVDELLEM
VGLEPEKYKNRKPDELSGGQRQRVGVIRALAADPPVILMDEPFSALDPISREKLQDDLIE
LQTKIKKTIIFVTHDIQEAMKLGDKICLLNEGHIEQIDTPEGFKNNPQSEFVKQFMGSHL
EDDAPCVEENA
>G2435_STAAU8325, UNDEFINED PRODUCT 2326069:2327847 REVERSE MW:68170
HGLMKGYTTSELSHLIDELRFKGFLNENDEI
LMCDTSIKKLLSNEVEVFTTPFKQKATEKVFINTVEGVDRVLFSQLVEVRKKLSDKLTIA
PVSIFSDYTLEEFAKRKPASKQDMINIDGVGSYKLKHYCPAFLETIQNYKAKV
LOCUS 77
>G2617_STAAU8325, UNDEFINED PRODUCT 2501985:2502917 REVERSE MW:34781
DRAIRSVAFFLTALPSYWIASILIIYVSVKLNILPTSGLTGP

LOCUS 78

IIAIIILIFISFFFSGSETALTAANKAKFKTEADKGDKKAKGIVKLLEKPSEFITTILIG
NNVANILLPTLVTIMALRWGISVGIASAVLTVVIILISEVIPKSVAATFPDKITRLVYPI
INICVIVFRPITLLLNKLTDSINRSLSKGQPQEHQFSKEEFKTMLAIAGHEGALNEIETS
RLEGVINFENLKVKDVDTTPRINVTAFASNATYEEVYETVMNKPYTRYPVYEGDIDNIIG
VFHSKYLLAWSNKKENQITNYSAKPLFVNEHNKAEWVLRKMTISRKHLAIVLDEFGGTEA
IVSHEDLIEELLGMEIEDEMDKKEKEKLSQQQIQFQQRKNRNVSI

LOCUS 79

>G1981_STAAU8325, UNDEFINED PRODUCT 1853885:1855240 REVERSE MW:50053
MINVTLKQIQSWIPCEIED

>G1982_STAAU8325, UNDEFINED PRODUCT 1855258:1856436 REVERSE MW:44485
VILLRFKDANKSINNRTKSILIYIKVANPDISLEENEMTKENICIVFGGKSAEHEVSILT
AQNVLNAIDKDKYHVDIIYITNDGDWRKQNNITAEIKSTDELHLENGEALEISQLLKESS
SGQPYDAVFPLLHGPNGEDGTIQGLFEVLDVPYVGNGVLSAASSMDKLVMKQLFEHRGLP
QLPYISFLRSEYEKYEHNILKLVNDKLNYPVFVKPANLGSSVGISKCNNEAELKEGIKEA
FQFDRKLVIEQGVNAREIEVAVLGNDYPEATWPGEVVKDVAFYDYKSKYKDGKVQLQIPA
DLDEDVQLTLRNMALEAFKATDCSGLVRADFFVTEDNQIYINETNAMPGFTAFSMYPKLW
ENMGLSYPELITKLIELAKERHQDKQKNKYKID

>G1983_STAAU8325, UNDEFINED PRODUCT 1856643:1857842 FORWARD MW:44601
MNYSSRQQPDKHWLRKVDWVLVATIAVLAIFSVLLINSAMGGGQYSANFGIRQIFYYILG
AIFAGIIMFISPKKIKHYTYLLYFLICLLLIGLLVIPESPITPIINGAKSWYTFGPISIQ
PSEFMKIILILALARVVSRHNQFTFNKSFQSDLLLFFKIIGVSLVPSILILLQNDLGTTL
VLAAIIAGVMLVSGITWRILAPIFITGIVGAMTVILGILYAPALIENLLGVQLYQMGRIN
SWLDPYTYSSGDGYHLTESLKAIGSGQLLGKGYNHGEVYIPENHTDFIFSVIGEELGFIG
SVILILIFLFLIFHLIRLAAKIEDQFNKIFIVGFVTLLVFHILQNIGMTIQLLPITGIPL
PFISYGGSALWSMMTGIGIVLSIYYHEPKRYVDLYHPKSN

LOCUS 80

MEROZOITE SURFACE ANTIGEN

DHGIVFNASLPLYKDAIHQKGSMRSNDNGDDMSMMVGTVLSGFEYRAQKEKYDNLYKFFK
ENEKKYQYTGFTKEAINKTQNVGYKNEYFYITYSSRSLKEYRKYYEPLIRKNDKEFKEGM
ERARKEVNYAANTDAVATLFSTKKNFTKDNTVDDVIELSDKLYNLKNKPDKSTITIQIGK
PTINTKKAFYDDNRPIEYGVHSKDE

SURFACE PROTEIN

MGCTVKMNKINDRDLTELSSYWVYQNIDIK
KEFKVNGKRFKQVDSYNDDKNSNLNGAADIKIYELLDDKSKPTGQQTIIYQGTSNEAINP
NNPLKSSGFGDDWLQNAKLMNNDNESTDYLKQTDQLSNQYKIKLEDADRLSNSDFLKKYR
MESSNFKNKTIVADGGNSEGGAGAKYQGAKHPNEKVVATDSAMIPYAAWQKFARPRFDNM
ISFNSTNDLLTWLQDPFIKDMPGKRVNINDGVPRLDTLIDSHVGYKRKLNRKDNTYDTVP

LIKIKSVKDTEIKNGKKVKKTINITLDMDGRIPINVWTGDSIARSGRGTLIKLNLENLDA
LSKLITGETSGMLAECVIFLNESFNISENENKNFADRKKQLSEGFKDKINLFQLEEMERT
LISKINSLEEVADETIESISAVKHLLPDFALDALKERINELFKGIKSFIEKVYDSIDNEI
LEIFKNIDHDFRDGVSEEMM
LOCUS 81
G0745
DHYVIQYFSGLIGGRGRRANLYGLFNKAIEFENSSFRGLYQFIRFIDELIERGKDFGEEN
VVGPNDNVVRMMTIHSSKGLEFPFVIYSGLSKDFNKRDLKQPVILNQQFGLGMDYFDVDK
EMAFPSLASVAYRAVAEKELVSEEMRLVYVALTRAKEQLYLIGRVKNDKSLLELEQLSIS
GEHIAVNERLTSPNPFHLIYSILSKHQSASIPDDLKFEKDIAQIEDSSRPNVNISIVYFE
DVSTETILDNDEYRSVNQLETMQNGNEDVKAQIKHQLDYRYPYVNDTKKPSKQSVSELKR
QYETEESGTSYERVRQYRIGFSTYERPKFLSEQGKRKANEIGTLMHTVMQHLPFKKERIS
EVELHQYIDGLIDKHIIEADAKKDIRMDEIMTFINSELYSIIAEAEQVYRELPFVVNQAL
VDQLPQGDEDVSIIQGMIDLIFVKDGVHYFVDYKTDAFNRRRGMTDEEIGTQLKNKYKIQ
MKYYQNTLQTILNKEVKGYLYFFKFGTLQL
G0746
MKFLSFKYNDKTSYGVKVKREDAVWDLTQVFADFAEGDFHPKTLLAGLQQNHTLDFQEQV
RKAVVAAEDSGKAEDYKISFNDIEFLPPVTPPNNVIAFGRNYKDHANELNHEVEKLYVFT
KAAS
LOCUS 82
G1333
SGTGFIVGKNTIVTNKHVVAGMEIGAHIIAHPNGEYNNGGFYKVKKIVRYSGQEDIAILH
VEDKAVHPKNRNFKDYTGILKIASEAKENERISIVGYPEPYINKFQMYESTGKVLSVKGN
MIITDAFVEPGNSGSAVFNSKYEVVGVHFGGNGPGNKSTKGYGVYFSPEIKKFIADNTDK
G1334
MNKNIIIKSIAALTILTSITGVGTTMVEGIQQTAKAENTVKQITNTNVAPYS
GVTWMGAGTGFVVGNHTIITNKHVTYHMKVGDEIKAHPNGFYNNGGGLYKVTKIVDYPGK
EDIAVVQVEEKSTQPKGRKFKDFTSKFNIASEAKENEPISVIGYPNPNGNKLQMYESTGK
VLSVNGNIVSSDAIIQPGSSGSPILNSKHEAIGVIYAGNKPSGESTRGFAVYFSPEIKKF
IADNLDK
LOCUS 83
G2364
MNMKKKEKHAIRKKSIGVASVLVGTLIGFGLLSSKEADASENSVTQSDSASNESKSNDSSSV SAAPKTDD
TNVSDTKTSSNTNNGETSVAQNPAQQETTQSSSTNATTEETPVTGEATTTTTNQANTPATTQ SSNTNAEE
LVNQTSNETTFNDTNTVSSVNSPQNSTNAENVSTTQDTSTEATPSNNESAPQSTDASNKDVV NQAVNTSA
PRMRAFSLAAVAADAPAAGTDITNQLTNVTVGIDSGTTVYPHQAGYVKLNYGFSVPNSAVKG DTFKITVP
KELNLNGVTSTAKVPPIMAGDQVLANGVIDSDGNVIYTFTDYVNTKDDVKATLTMPAYIDPE

NVKKTGNV
TLATGIGSTTANKTVLVDYEKYGKFYNLSIKGTIDQIDKTNNTYRQTIYVNPSGDNVIAPVL TGNLKPNT
DSNALIDQQNTSIKVYKVDNAADLSESYFVNPENFEDVTNSVNITFPNPNQYKVEFNTPDDQ ITTPYIVV
VNGHID
LOCUS 84
G2820
MNMKKKEKHAIRKKSIGVASVLVGTLIGFGLLSSKEADASENSVTQSDSASNESKSNDSSSV SAAPKTDD
TNVSDTKTSSNTNNGETSVAQNPAQQETTQSSSTNATTEETPVTGEATTTTTNQANTPATTQ SSNTNAEE
LVNQTSNETTFNDTNTVSSVNSPQNSTNAENVSTTQDTSTEATPSNNESAPQSTDASNKDVV NQAVNTSA
PRMRAFSLAAVAADAPAAGTDITNQLTNVTVGIDSGTTVYPHQAGYVKLNYGFSVPNSAVKG DTFKITVP
KELNLNGVTSTAKVPPIMAGDQVLANGVIDSDGNVIYTFTDYVNTKDDVKATLTMPAYIDPE NVKKTGNV
TLATGIGSTTANKTVLVDYEKYGKFYNLSIKGTIDQIDKTNNTYRQTIYVNPSGDNVIAPVL TGNLKPNT
DSNALIDQQNTSIKVYKVDNAADLSESYFVNPENFEDVTNSVNITFPNPNQYKVEFNTPDDQ ITTPYIVV
VNGHID
LOCUS 85
>G0455_STAAU8325, UNDEFINED PRODUCT 416425:417609 REVERSE MW:43472
RYLHQHPELSFHEDETAKYIAEFYKGKDVEVETNVGP
RGIKVTIDSGKPGKTLAIRADFDALPITEDTGLSFASQNKGVMHACGHDAHTAYMLVLAE
TLAEMKDSFTGKVVVIHQPAEEVPPGGAKTMIENGVLDGVDHVLGVHVMSTMKTGKVYYR
PGYVQTGRAFFKLKVQGKGGHGSSPHMANDAIVAGSYFVTALQTVVSRRLSPFETGVVTI
GSFDGKGQFNVIKDVVEIEGDVRGLTDATKATIEKEIKRLSKGLEDMYGVTCTLEYNDDY
PALYNDP
LOCUS 86
>G2379_STAAU8325, UNDEFINED PRODUCT 2264977:2265987 REVERSE MW:37179
GSTMACVSEAIHLLPYNVFFVPARGGLGENV
VFQANTIAASMAQQAGGYYTTMYVPDNVSETTYNTLLLEPSVINTLDKIKQANVILHGIG
DALKMAHRRQSPEKVIEQLQHHQAVGEAFGYYFDTQGQIVHKVKTIGLQLEDLESKDFIF
AVAGGKSKGEAIKAYLTIAPKNTVLITDEAAAKIILE
>G2378_STAAU8325, UNDEFINED PRODUCT 2263914:2264921 REVERSE MW:36281

MAVKVAINGFGRIGRLAFRRIQEVEGLEVVAVNDLTDDDMLAHLLKYDTMQGRFTGEVEV
VDGGFRVNGKEVKSFSEPDASKLPWKDLNIDVVLECTGFYTDKDKAQAHIEAGAKKVLIS
APATGDLKTIVFNTNHQELDGSETVVSGASCTTNSLAPVAKVLNDDFGLVEGLMTTIHAY
TG
LOCUS87
>G1472_STAAU8325, UNDEFINED PRODUCT 1435745:1436533 REVERSE MW:30166
DNFKKQPHHLIYEELLQQGITLGITTRGDGLSDYPKNAFNMARYIDDR
LOCUS88
>G2206_STAAU8325, UNDEFINED PRODUCT 2093451:2094926 REVERSE MW:55558
VILALPMFILLTFYLQP
LVRYIFERIVMAVIVIIGVIVSVFTILYFSPLDAAYSILGQNATKAQIHQFNVLHHLNEP
YFIQLWDTIKGVFTFDLGTTYKGNEVVTKAVGERIPITIIVAVLALMVALIIAIPIGIIS
AMKRNSWLDITLMIIALIGLSIPSFWQGLLFILAFSLKLDILPPSYMPEHPISLILPVLV
IGTSIAASITRMTRSSVLEVMRSDYVLTAYAKGLSTTQVVIKHILKNAIIPIVTLVGLLV
AELLGGSAVTEQVFNINGIGRYIVQKQLIPDIPAVMGGVVYISIVISLANLIIDIFYALI
DPKLRSEINERK
>G2205_STAAU8325, UNDEFINED PRODUCT 2092282:2093451 REVERSE MW:43439
VRHMAQLNSKIASLKLFASYAIATYILVILTSALNLFKGYVADTFYIAETLLIVLTIILI
IILTTEQTWKHHDLWRRIVEVLLLLMTLTGNVFTLLMFVSIRRYQRTSQIHSYNGWESFI
RKTTRHRIAIIGLLILVYMLTLSIVSQFTFDTTLATKNQFNALLHGPSLAYPFGTDDFGR
DLFTRVVVGTKLTFSISIISVVIAVIFGVLLGTIAGYFNHIDNLIMRILDVVFAIPSLLL
AVAIIASFGASIPNLIIALSIGNIPSFARTMRASVLEIKRMEYVDAARITGENTWNIIWR
YILPNAIAPMIVRFSLNIGVVVLTTSSLSFLGLGVAPDVAEWGNILRTGSNYLETHSNLA
IVPGVCIMFVVLAFNFIGDAVRDALDPRIH
>G2204_STAAU8325, UNDEFINED PRODUCT 2090490:2092262 REVERSE MW:66992
VKKIISIAIIVLALVLSGCGVPTKSEVAQKSSKVEVKGERPTIHFLGQASYENDMNIVKD
QLENAGFNVKMNIQPDYGSYRTQRQAGNYDIQIDDWMTVFGDPNYAMTALFSSTGSNSLL
KDKHVDQLLNKASTQNEADVKQTYKQIEDEVVFDKGYMAPLYGSKKNLVYDNKVLDKNSV
GLPNSRALIWQQFDYNNSRERDTRPLVMTQQDGEIPTLDPIRSIAPSVYSINMNMYTRLL
LLDENDHLTTKGSLSHDYAVNKDNKAFYFLLRDDDYFAKVVNGQARNTGERVSAEDVKFS
LDRARDKKSVPNNNTYNMHKHINDIKILKDEDIDQLRKEKDKDDKSIYDKLIKAYNVKSL
TTDGQKVNNKDGIYQIVKITTDQSMPREVNYLTHSSAGILSKKFVNQVNQEYPKGYGDSS
TIPANSDGKNALYASGAYIMTQKNAYQATFQRNPGFNETEKGSYGPAKIKNITLKFNGDP
NNALSELRNHSIDMLADVNQKHFDLIKSDKNLSIIRKNGRKSVFLMLNIKKGIFKTHPNL
RQAVVNAIDQDQFIKFYRGDKFKIASPITPLVDTGNEQRQDLEKVEKAINQ
>G2203_STAAU8325, UNDEFINED PRODUCT 2088446:2090449 REVERSE MW:74694
MVINLNDKQTKTSKEGLISVSHPLAAKIGKDVLDQGGNAMDAVIAIQLALNVVEPFASGI
GGGGYLLYYEQSTGSITAFDARETAPEHVDKQFYLDDSGEYKSFFDMTTHGKTVAVPAIP
KLFDYIHKRYAKLSLEDLINPAIELAIEGHAANWATEKYSRQQHARLTKYHETAQVFTHE

NQYWREGDWIVQPELGKTFQILREQGFNAFYKGDIAKQLVNVVKACGGTITLED
LOCUS 89
>G0815_STAAU8325, UNDEFINED PRODUCT 808746:808916 REVERSE MW:6481
VISANLISIGSQVSTKDQLLLPRMRYGNAYNMSAKAIHIHNDNQLNTAI
>G0816_STAAU8325, UNDEFINED PRODUCT 807493:808986 FORWARD MW:56448
RIAVLSWLSLCICIALALILYALPYLILGSNNWSFVLTWLPIEIKLALITTLIAL
FSTLIVILLFLHTKITKT
>G0817_STAAU8325, UNDEFINED PRODUCT 809084:809941 REVERSE MW:31551
VFIMSKIFVTGATGLIGIKLVQRLKEEGHEVAGFTTSENGQQKLAAVNVKAYIGDILKAD
TIDQALADFKPEIIINQITDLKNVDMAANTKVRIEGSKNLIDAAKKHDVKKVIAQSIAFM
YEPGEGLANEETSLDFNSTGDRKVTVDGVVGLEEETARMDEYVVLRFGWLYGPGTWYGKD
GMIYNQFMDGQVTLSDGVTSFVHLDDAVETSIQAIHFENGIYNVADDAPVKGSEFAEWYK
EQLGVEPNIDIQPAQPFERGVSNEKFKAQGGTLIYQTWKDGMNPIK
>G0818_STAAU8325, UNDEFINED PRODUCT 810088:810282 FORWARD MW:7657
MTNLNYDEDQSRKTAPRSFQFESTLLLFFIYYISIL
VADFL
LOCUS 92
>G2378_STAAU8325, UNDEFINED PRODUCT 2263914:2264921 REVERSE MW:36281
MAVKVAINGFGRIGRLAFRRIQEVEGLEVVAVNDLTDDDMLAHLLKYDTMQGRFTGEVEV
VDGGFRVNGKEVKSFSEPDASKLPWKDLNIDVVLECTGFYTDKDKAQAHIEAGAKKVLIS
APATGDLKTIVFNTNHQELDGSETVVSGASCTTNSLAPVAKVLNDDFGLVEGLMTTIHAY
T
>G2379_STAAU8325, UNDEFINED PRODUCT 2264977:2265987 REVERSE MW:37179
GSTMACVSEAIHLLPYNVFFVPARGGLGENV
VFQANTIAASMAQQAGGYYTTMYVPDNVSETTYNTLLLEPSVINTLDKIKQANVILHGIG
DALKMAHRRQSPEKVIEQLQHHQAVGEAFGYYFDTQGQIVHKVKTIGLQLEDLESKDFIF
AVAGGKSKGEAIKAYLTIAPKNTVLITDEAAAKIILE
LOCUS 93
>G2768_STAAU8325, UNDEFINED PRODUCT 2648049:2649509 FORWARD MW:52382
AIYQNKDGHLKRTLRVRDFLALGVGTIVSTSIFTLPGIVAA
EHAGPAVALSFLLAAIVAGLVAFTYAEMAAAMPFAGSAYSWVNVLFGEFFGWVAGWALLA
EYFIAVAFVASGFSANLRGLVKPIGIELPAALSNPFGTNGGFIDIIAAIVILLTALLLSR
GMSEAARMENILVILKVLAIILFVIVGLTAINVSNYVPFIPEHKVTATGDFGGWQGIYAG

VSMIFLAYIGFDSIAANSAEALDPQKTMPRGILGSLSVAIVLFIAVALVLVGMFHYSQYA
NNAEPVGWALRQSGHGVVAAIVQAISVIGMFTALIGMMLAGSRLLYS
LOCUS 94
>G2374_STAAU8325, UNDEFINED PRODUCT 2260182:2261696 REVERSE MW:56424
MAKKPTALIILDGFANRESEHGNAVKLANKPNF
>G2375_STAAU8325, UNDEFINED PRODUCT 2261702:2262559 REVERSE MW:30982
DQLKSVVIAYEPIWAIGTGKSSTSEDANEMCAFVRQTIADLSSKEVSEA
TRIQYGGSVKPNNIKEYMAQTDIDGALVGGASLKVEDFVQLLEGAK
LOCUS 95
>G2535_STAAU8325, UNDEFINED PRODUCT 2417067:2417516 FORWARD MW:16668
ILNFIFSFLASMFFCVIFDAPRKLYLSCGFVGTCGWMVYTLFFNGFNVHTIYSSFFG
SLALGLLSHYMARKQKEPAIIFMVTGIIPLVPGGLAYDATKNLVLLNFSTAINTMLEVTL
IAGAIALGLLFADQISKLIVSGFVKSFKRL
>G2537_STAAU8325, UNDEFINED PRODUCT 2417664:2419181 REVERSE MW:55776
LGIEYLRGEFLFMEKKNKQIDRGDLKQNLSEKFVWAIAYGSCIGWGAFILPGDWIKQSGP
IAASIGIVIGALLMILIAVSYGALVERFPVSGGAFAFSFLSFGRYVSFFSSWFLTFGYVC
VVALNATAFSLLVKFLLPDVLNNGKLYTIAGWDVYITEIIIATVLLLVFMLVTIRGASVS
GSLQYYFCVAMVIVVLLMFFGSFFGNNFALENLQPLAEPSKGWLVSIVVIVSVAPWAYVG
FDNIPQTAEEFNFAPNKTFKLIVYSLLAASLTYVVMILYTGWLSTSHQSLNGQLWLTGAV
TQTAFGYIGLGVLAIAIMMGIFTGLNGFLMSSSRLLFSMGRSGIMPTMFSKLHSKYKTPY
VAIIFLVGVSLIAPWLGRTALTWIVDMSSTGVSIAYFITCLSAAKLFSYNKQSNTYAPVY
KTFAIIGSFVSFIFLALLLVPGSPAALTAPSYIALLGWLIIGLIFFVIRYPKLKNMDNDE
LSRLILNRSENEVDDMIEEPEKEKTK
G2538?
LOCUS 96
>G2914_STAAU8325, UNDEFINED PRODUCT 2799733:2801715 FORWARD MW:74379
DPTLRRVMNEIDKKPELRERFITSDDAWDMMTSKTTV
VIVDTHKPELVLDENVLNKANRKVVIDH
LOCUS 97
>G0929_STAAU8325, UNDEFINED PRODUCT 926398:927756 FORWARD MW:50481
IGIPFAAGLINFVVLTAAASSCNSGIF
SNSRMLFGLSSQQQAPPNFSKTNKYGVPHVAIFASSALLLVAALLNYIFPDATKVFTYVT

TISTVLFLVVWGLIIIAYINYSRKNPDLHKNATYKLLGGKYMGYLIFVFFIFVFGLLFIN
VDTRRAIYFIPIWFILLAFMYLRYKRIAAKSNK
>G0930_STAAU8325, UNDEFINED PRODUCT 927795:928619 REVERSE MW:32642
MRMKEDHMKNGQLKPGYNLQIATNSQFVLSYDLFQNPTDTRTLIPFLTMIQNTFGYLPEY
IVADAGYGSEQNYMAIIDDFNKTPLITYGMFIKDKTRKFKSGIFNTQNWKYDELNNEFIC
PNNKRIGFKRYAYRNDRYGFKRDFKLYECDDCSSCSLRHQCMKPNSKSNKKIMKNYNWEY
FKVQINQKLSEPETKNIYSQRKIDVEPAFGFMKAILGFTRMSVRGINKVKRELGFVLMAL
NIRKIAAQRAVHYKIHIKKADFYQIINRNQLFYIA
>G0931_STAAU8325, UNDEFINED PRODUCT 928619:929443 REVERSE MW:32667
MYKIYNMTQLTLPIETSVRIPQNDISRYVNEIVETIPDSEFDEFRHHRGATSYHPKMMLK
IILYAYTQSVFSGRRIEKLLHDSIRMMWLAQDQTPSYKTINRFRVNPNTDALIESLFIQF
HSQCLKQNLIDNNSIFIDGTKVEANANRYTFVWKKSIQNHESKLNENSKTLYRDLVEEKI
IPEIKEDGDSDLTIEEIDLIGSHLDKEIEDLNHSIENEDCAQIRKQTRKKITEIKKFKKK
FDDYSERKNKYEEQKSILKDRNSFSKTDLIMMQLL
>G0932_STAAU8325, UNDEFINED PRODUCT 930087:931841 REVERSE MW:63103
SVVGTTLVAETVKDLEGKDLSDKVIVTNSIDETFVPYVEKALGLITEENGITSPS
AIVGLEKGIPTVVGVEKAVKNISNNMLVTIDAAQGKIFEGYANVL
LOCUS 98
>G2804_STAAU8325, UNDEFINED PRODUCT 2682166:2682924 REVERSE MW:29096
MAYISLNYHSPTIGMHQNLTVILPEDQSFFNSDTTVKPLKTLMLLHGLSSDETTYMRYTS
IERYANEHKLAVIMPNVD
>G2805_STAAU8325, UNDEFINED PRODUCT 2683043:2685673 REVERSE MW:93576
DQTVPQEANSQVDNKTTNDANSIATNSELKNSQTLDLPQSSPQTIS
NAQGTSKPSVRTRAVRSLAVAEPVVNAADAKGTNVNDKVTASNFKLEKTTFDPNQSGNTF
MAANFTVTDKVKSGDYFTAKLPDSLTGNGDVDYSNSNNTMPIADIKSTNGDVVAKATYDI
LTKTYTFVFTDYVNNKENINGQFSLPLFTDRAKAPKSGTYDANINIADEMFNNKITYNYS
SPIAGIDKPNGANISSQIIGVDTASGQNTYKQTVFVNPKQRVLGNTWVYIKGYQDKIEES
SGKVSATDTKLRIFEVNDTSKLSDSYYADPNDSNLKEVTDQFKNRIYYEHPNVASIKFGD
ITKTYVVLVEGHYDNTGKNLKTQVIQENVDPVTNRDYSIFGWNNENVVRYGGGSADGDSA
VNPKDPTPGPPVDPEPSPDPEPEPTPDPEPSPDPEPEPSPDPDPDSDSDSDSGSDSDSGS
DSDSESDSDSDSDSDSDSDSESDSDSESDSESDSDSDSDSDSDSDSDSDSDSDSDSDS
DSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDS
DSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDSDS
DSDSDSDSDSDSDSDSDSDSDSRVTPPNNEQKAPSNPKGEVNHSNKVSKQHKTDALPE
TGDKSENTNATLFGAMMALLGSLLLFRKRKQDHKEKA
LOCUS 99
>G2284_STAAU8325, UNDEFINED PRODUCT 2182330:2183307 REVERSE MW:37252
VEDLERVLITGGAGFIGSHLVDDLQQDYDVYVLDNYRTGKRENIKSLADDHVFELDIREY
DAVEQIMKTYQFDYVIHLAALVSVAESVEKPILSQEINVVATLRLLEIIK

>G2285_STAAU8325, UNDEFINED PRODUCT 2183380:2183499 REVERSE MW:4917
MHQLKALLVLTHPRYYKTSQKHHYLIYLNKNSQSYLILFL
>G2286_STAAU8325, UNDEFINED PRODUCT 2183646:2184428 REVERSE MW:27575
IFMTNNKVALVTGGAQGIGFKIAERLVEDGFKVAVVDFNEEGAKAAALKLSSDGTKAIA
IKADVSNRDDVFNAVRQTAAQFGDFHVMVNNAGLGPTTPIDTITEEQFKTVYGVNVAGVL
WGIQAAHEQFKKFNHGGKIINATSQAGVEGNPGLSLYCSTKFAVRGLTQVAAQDLASEGI
TVNAFAPGIVQTPMMESIAVATAEEAGKPEAWGWEQFTSQIALGRVSQPEDVSNVVSFLA
GKDSDYITGQTIIVDGGMRFR
LOCUS 100
>G1465_STAAU8325, UNDEFINED PRODUCT 1429687:1432446 REVERSE MW:105241
VKKMDYKETLLMPKTDFPMRGGLPNKEPQIQEKWDAEDQYHKALEKNKGNETFILHDGPP
YANGNLHMGHALNKILKDFIVRYKTMQGFYAPYVPGWDTHGLPIEQALTKKGVDRKKMST
AEFREKCKEFALEQIELQKKDFRRLGVRGDFNDPYITLKPEYEAAQIRIFGEMADKGLIY
KGKKPVYWSPSSESSLAEAEIEYHDKRSASIYVAFDVKDDKGVVDADAKFIIWTTTPWTI
PSNVAITVHPELKYGQYNVNGEKYIIAEALSDAVAEALDWDKASIKLEKEYTGKELEYVV
AQHPFLDRESLVINGDHVTTDAGTGCVHTAPGHGEDDYIVGQKYELPVISPIDDKGVFTE
EGGQFEGMFYDKANKAVTDLLTEKGALLKLDFITHSYPHDWRTKKPVIFRATPQWFASIS
KVRQDILDAIENTNFKVNWGKTRIYNMVRDRGEWVISRQRVWGVPLPVFYAENGEIIMTK
ETVNHVADLFAEHGSNIWFEREAKDLLPEGFTHPGSPNGTFTKETDIMDVWFDSGSSHRG
VLETRPELSFPADMYLEGSDQYRGWFNSSITTSVATRGVSPYKFLLSHGFVMDGEGKKMS
KSLGNVIVPDQVVKQKGADIARLWVSSTDYLADVRISDEILKQTSDVYRKIRNTLRFMLG
NINDFNPDTDSIPESELLEVDRYLLNRLREFTASTINNYENFDYLNIYQEVQNFINVELS
NFYLDYGKDILYIEQRDSHIRRSMQTVLYQILVDMTKLLAPILVHTAEEVWSHTPHVKEE
SVHLADMPKVVEVD
LOCUS 101 (GF7)
>G1243_STAAU8325, UNDEFINED PRODUCT 1200372:1201841 FORWARD MW:54782
DQVQGSLEIIYSLQEELKEITGMDEVTLQPAAGAHGEWTALMIFKAYHENNGEGHRDEVIVP DSAHGTNPASA
SFAGFKSVTVKSNERGEVDIDDLKRVVNENTAAIMLTNPNTLGIFEKNIMEIREIVHNAG
GLLYYDGANLNAIMDKVRPGDMGFDAVHLNLHKTFTGPHGGGGPGSGPVGVVKELASYLP
KPMVIKDGDKFKYDNDIKNSIGRVKPFYGNFGIYLRAYTYIRTMGATGLKEVSEAAVLNA
NYIKARLSKHFEIPYKQYCKHEFVLSGVRQKEFGVRTLDMAKRLLDFGVHPPTIYFPLNV
EEGMMIEPTETESKETLDYFIDTLISIAEEAKNDPDKVLEAPHTTVIDRLDEATAARKPI
LKFENLKQEK
LCOUS 102
>G2529 FRG_STAAU8325, UNDEFINED PRODUCT 2410504:2411484 REVERSE MW:36804
LIKSGKARAHTNIALIKYWGKKDEALIIPMNNSISVTLEKFYTETKVTFNDQLTQD
>G2530_STAAU8325, UNDEFINED PRODUCT 2411492:2412409 REVERSE

MW:32919
MTRKGYGESTGKIILIGEHAVTFGEPAIAVPFNAGKIKVLIEALESGNYSSIKSDVYDGM
LYDAPDHLKSLVNRFVELNNITEPLAVTIQTNLPPSRGLGSSAAVAVAFVRASYDFLGKS
LTKEELIEKANWAEQIAHGKPSGIDTQTIVSGKPVWFQKGHAETLKTLSLDGYMVVIDTG
VKGSTRQAVEDVHKLCEDPQYMSHVKHIGKLVLRASDVIEHHNFEALADIFNECHADLKA
LTVSHDKIEQLMKIGKENGAIAGKLTGAGRGGSMLLLAKDLPTAKNIVKAVEKAGAAHTW
IENLGG
>G2531 FRG_STAAU8325, UNDEFINED PRODUCT 2412999:2413832 REVERSE MW:31735
NAIVRNSGGLGVVLDQGVLNISLMFKGQTETTIDEAFTV
MYLLISKMFENENVDIDTMEIEHSYCPGKFDLSIDGKKFAGISQRRVRGGIAVQIYLCVE
GSGSERALMMQTFYEHALKGEVTKFKYPEIEPSCMASLETLLNKTITVQDVMFLLLYAIK
DLGGVLNMTPITQEEWQRYDTYFDKMIERNKKMIDQMQ
LOCUS 103 (GF11)
>G2235 FRG_STAAU8325, UNDEFINED PRODUCT 2133494:2134471 REVERSE MW:36941
VTMKRLSIIVIIGIFIITGCDWQRTSKERSKNAQNQQVIKIGYLPITHSANLMMTKKLLS
QYNHPKYKLELVKFNNWPDLMDALNSGRIDGASTLIELAMKSKQKGSNIKAVALGHHEGN
VIMGQKGMHLNEFNNNGDDYHFGIPHRYSTHYLLLEELRKQLKIKPGHFSYHEMSPAEMP
AALSEHRITGYSVAEPFGALGEKLGKGKTLKHGDDVIPDAYCCVLVLRGELLDQHKDVAQ
AFVQDYKKSGFKMND
>G2236_STAAU8325, UNDEFINED PRODUCT 2134482:2135219 REVERSE MW:28095
MIKIQQLQHHFGSHKVIHNFNLDISKGEIVTFIGKSGCGKSTLLNIIGGFIHPSSGRVII
DNEIKQQPSPDCLMLFQHHNLLPWKTINDNIRIGLQQKISDEEINAQLKLVDLEDRGKHF
PEQLSGGMKQRVALCRAHVHKPNVILMDEPLGALDAFTRYKLQDQLVQLKHKTQSTIILV
THDIDEAIYLSDRIVLLGEGCNIISQYEITASHPRSRNDSHLLKIRNEIMETFALNHHQV
EPEYYL
LOCUS 104 (GF12)
>G2828 FRG_STAAU8325, UNDEFINED PRODUCT 2715541:2717115 REVERSE MW:59929
VKMMPRKFRVLQIGGDDLEPIFQHKKGVSWDYFDIGLFEFDSGYVEAIEAIVEAEGRFDF
IYIQAPYSETLTNLLQMISEPYNTYVDESFWSVEYEQDENVQKYVVQPLHYRNIEERNNK
LEAVSFSGQYGDKVSPKLALVHPNFKGDVVYQGNSELTLSGEFGKEFKPIASWQNNLVYD
KDKVIQIWPEFDIDGAVELQYTFRLIQTGADGALIEQIVLTDDMLDSPLEIPAKPFDAYI
SVTVKARGNGTVHLGPIHKRWSRLDMGQFLLGGSRFVDSQRQEFIYYFHPGDMKPPLNVY
FSGYRTAEGFEGYYMMKRMNAPFLLIGD
>G2829 FRG_STAAU8325, UNDEFINED PRODUCT 2717099:2718649 REVERSE MW:61259
DQDDIIAVKTIHAEHDVVEALRTLRLVIDMSKEPDLYLQISAISAGIPQINGQQTDYVSDYD NGRIINTVDELDDALNYYLFYLKNWNYAYAYSLKLIDAYASKNIINQLDELIEGENDAT
LOCUS 105 (E18)
>G2912 FRG STAAU8325, UNDEFINED PRODUCT 2797518:2798504

FORWARD MW:37832
SKSYDERFTPDEVVAYQQHQGNKFKEHFDLNCYLTLLDVLDSHNIDRGRTDVTHVFKNLETK VLTMGFIDDLLYPDD
LOCUS 106 (E101)
>G1083 FRG_STAAU8325, UNDEFINED PRODUCT 1057165:1058778 REVERSE MW:57664
DREKLQERLAKLAGGVAVIKVGAASETELKERKLRIEDALNSTRAAVEEGIVAGGGTALVNV
YQKVSEIEAEGDIETGVNIVLKALTAPVRQIAENAGLEGSVIVERLKNAEPGVGFNAATN
EWVNMLE
LOCUS 107 (E110)
>G0975_STAAU8325, UNDEFINED PRODUCT 975981:977042 REVERSE MW:40300
MKLQTTYPSNNYPIYVEHGAIDHISTYIDQFDQSFILIDEHVNQYFADKFDDILSYENVH
KVIIPAGEKTKTFEQYQETLEYILSHHVTRNTAIIAVGGGATGDFAGFIAATLLRGVHFI
QVPTTILAHDSSVGGKVGINSKQGKNLIGAFYRPTAVIYDLVFLKTLPFEQILSGYAEVY
KHALLNGESATQDIEQHFKDREILQSLNGMDKYIAKGIETKLDIVIADEKEQGVRKFLNL
GHTFGHAVEYYHKIPHGHAVMVGIIYQFIVANALFDSKHDINHYIQYLIQLGYPLDMITD
LDFETLYQYMLSDKKNDKQGVQMVLIRQFGDIVVQHVDQLTLQHACEQLKTYFK
LOCUS 108 (E125)
>G2809_STAAU8325, UNDEFINED PRODUCT 2689308:2690324 REVERSE MW:38103
VKIMTEIQKPYDLKGRSLLKESDFTKAEFEGLIDFAITLKEYKKNGIKHHYLSGKNIALL
FEKNSTRTRAAFTVASIDLGAHPEFLGKNDIQLGKKESVEDTAKVLGRMFDGIEFRGFSQ
QAVEDLAKFSGVPVWNGLTDDWHPTQMLADFMTIKENFGYLEGINLTYVGDGRNNIAHSL
MVAGAMLGVNVRICTPKSLNPKEAYVDIAKEKASQYGGSVMITDNIAEAVENTDAIYTDV
WVSMGEESEFEQRINLLKDYQVNQQMFDLTGKDSTIFLHCLPAFHDTNTLYGQEIYEKYG
LAEMEVTDQIFRSEHSKVFDQAENRMHTIKAVMAATLGS
>G2810_STAAU8325, UNDEFINED PRODUCT 2690351:2691583 REVERSE MW:46915
DRDCPFNIEGGDELVLSKDVLAIGVSERTSAQAIEKLARRIFENPQATFKKVVAIEIPTSRT FMHLDTVFTMIDYDKFTMHSAILKAEGNMNIFIIEYDDVNKDIAIKQSSHLKDTLEDVLGID DIQFIPTGNGDVIDGAREQWNDGSNTLCIRPGVVVTYDRNYVSNDLLRQKGIKVIEISGSEL VRGRGGPRCMSQPLFREDI
LOCUS 109 (F101)
>G1098 FRG_STAAU8325, UNDEFINED PRODUCT 1068360:1069841 REVERSE MW:57928
MTEWTREERYQRIEDVDTEYFKTLKQQVDQSKFRQQFHIQPETGLLNDPNGLIFYKGKYY
VSHQWFPLGAVHGLKYWYNYTSDDLINFKAEGPILNPDTKYDSHGVYSGSAFEYNGHLYY
MYTGNHRDNHWQRHASQMIARLKEDGSVEKFPKPVISQQPEGYTSHFRDPKVFKYDEKYY
AIIGAQNNDQQGRLLLYNTEDIINWHYLGEINTELDDFGYMWECPDYFNVDNQDVILICP
QGI

>G1099_STAAU8325, UNDEFINED PRODUCT 1069993:1070940 REVERSE MW:35500
MKNISDIAKLAGVSKSTVSRFLNNGSVSKKTSEKLTRIIAEHDYQPNQFAQSLRARQTHL
IGAIIPRMNSYAVDETIKGLAKQCQKYESQLILNYTGLNIEAEIQALETLARSKVDGIVL
MATDITERHIEVINKMNVPIVIVGQQHEQLHSIVHDDYKAGQIIGEWIGQQGYQQVEVFS
VSEKDIAVGIHRKRGLLDQLAKYQIKPNIHETNFTYVEAQKDVANVLENVEQVDAVVGAT
DTIALAAYKYYSDKKDVMKPHQIYGFGGDPMTQLVSPSIKTIHYNYFEAGQCAMEEIQQM
LKKQDMPYSVTVDVNI
>G1100_STAAU8325, UNDEFINED PRODUCT 1071126:1072409 REVERSE MW:46849
LSDYYEKKGVVSMNLNDTIFMFLCTLLVWLMTPGLSLFYGGLVQSKNALNTVMQSMAAIV
LVTFVWITVGFTISFGNGNLWFGNWEYTFLNHVGFATQEDISPHIPFALFMLFQMMFCTI
AISILSGSIAEKMKFIPYLLFVVIWTALVYSPVAHWVWGGGWINKLGVLDFAGGTVVHIT
SGVSGLVLAIMIGKGNKHSESTPHNLIITLIGGIFVWIGWYGFNVGSAFTFDNIAMLAFT
NTVISASAGAIGWLILEYIFKKTTSLLGLLLGALAGLVVITPAAGYVTYLSATIMALIGG
ICCYIVINYIKVKLKYHDALDAFGIHGVGGIIGAVLTAVFQSKKANPDIENGFIYTGDIH
IILVQILCVTAVVIFSIVMTFIIAKVIKLITPLSVTEQETNIGLDKIVHGEHAYFEGELN
RFNKHIRY
>G1101_STAAU8325, UNDEFINED PRODUCT 1072584:1072829 REVERSE MW:9040
VIGKGEIIMIHELGTVGMVCPFPLIEAQKKMATLQSGDELKIDFDCTQATEAIPNWAAEN
GYPVTNYEQIDNASWTITIQKV
LOCUS 110 (F113)
>G1446_STAAU8325, UNDEFINED PRODUCT 1408055:1410469 REVERSE MW:92806
VAIMIAKVIVDVASKSVDYKFDYIIPEQLESVIQPGVRVIVPFGPRTIQGYVMEVTAEPD
AQLDVSKLKKIIEVKDIQPELTSELIALSEWMGSTHVIKRISMLEVMLPSAIKAKYKKAF
KMKDDIELPSALLQKFDKHGYYYYKDAQKNNDIQLLMKLLKDDIVEEKTILTQNITKKTK
RAVRVIEGYHPDEVLAKLEKVIKQYDLYAYLSEEQHKTIFLTDIEDMGFSKSSLDGLIKK
GYVEKYDAVVERD
LOCUS 111
G2820
>G2820_STAAU8325, UNDEFINED PRODUCT 2704341:2706197 FORWARD MW:69253
MPKNKILIYLLSTTLVLPTLVSPTAYADTPQKDTTAKTTSHDSKKSNDDETSKDTTSKDI
DKADKNNTSNQDNNDKKFKTIDDSTSDSNNIIDFIYKNLPQTNINQLLTKNKYDDNYSLT
TLIQNLFNLNSDISDYEQPRNGEKSTNDSNKNSDNSIKNDTDTQSSKQDKADNQKAPKSN
NTKPSTSNKQPNSPKPTQPNQSNSQPASDDKANQKSSSKDNQSMSDSALDSILDQYSEDA
KKTQKDYASQSKKDKNEKSNTKNPQLPTQDELKHKSKPAQSFNNDVNQKDTRATSLFETD
PSISNNDDSGQFNVVDSKDTRQFVKSIAKDAHRIGQDNDIYASVMIAQAILESDSGRSAL
AKSPNHNLFGIKGAFEGNSVPFNTLEADGNQLYSINAGFRKYPSTKESLKDYSDLIKNGI
DGNRTIYKPTWKSEADSYKDATSHLSKTYATDPNYAKKLNSIIKHYQLTQFDDERMPDLD
KYERSIKDYDDSSDEFKPFREVSDSMPYPHGQCTWYVYNRMKQFGTSISGDLGDAHNWNN
RAQYRDYQVSHTPKRHAAVVFEAGQFGADQHYGHVAFVEKVNSDGSIVISESNVKGLGII
SHRTINAAAAEELSYITGK

G2821
>G2821_STAAU8325, UNDEFINED PRODUCT 2706470:2707033 REVERSE MW:20989
SDDKHDFIIEQILSRSCDIESVESWKSSL
LOCUS 112
>G1905_STAAU8325, UNDEFINED PRODUCT 1786046:1787398 REVERSE MW:48776
MKDEQLYYFEKSPVFKAMMHFSLPMMIGTLLSVIYGILNIYFIGFLEDSHMISAISLTLP
VFAILMGLGNLFGVGAGTYISRLLGAKDYSKSKFVSSFSIYGGIALGLIVILVTLPFSDQ
IAAILGARGETLALTSNYLKVMFLSAPFVILFFILEQFARAIGAPMVSMIGMLASVGLNI
>G1906_STAAU8325, UNDEFINED PRODUCT 1787508:1787924 REVERSE MW:16172
QGHTLGYLYAHQQDGLTQNDIAKALQRT
GPTVSNLLRNLERKKLIYRYVDAQDTRRKNIGLTTSGIKLVEAFTSIFDEMEQTLVSQLS
EEENEQMKANLTKMLSSLQ
LOCUS 113
G1111
>G1111_STAAU8325, UNDEFINED PRODUCT 1083909:1085690 FORWARD MW:65093
DPSEINKVIHVDLGIIADCKRFLECLNDKNVETIEHSDWVKHCQNNKQKHPFKLGEEDQVFC
KPQQTIEYIGKITNGEAIVTTDVGQHQMWAAQFYPFKNHGQWVTSGGLGTMGFGIPSSIGAK
LANPDKTVVCFVGDGGFQ
MTNQEMALLPEYGLDVKIVLINNGTLGMVKQWQDKFFNQRFSHSVFNGQPDFMKMAEAYG
VKGFLIDKPEQLEEQLDAAFAYQGPALIEVRISPTEAVTPMVPSGKSNHEMEGL
G1112
>G1112_STAAU8325, UNDEFINED PRODUCT 1085693:1085944 FORWARD MW:9621
MTRILKLQVADQVSTLNRITSAFVRLQYNIDTLHVTHSEQPGISNMEIQVDIQDDTSLHI
LIKKLKQQINVLTVECYDLVDNEA
G1113
>G1113_STAAU8325, UNDEFINED PRODUCT 1086069:1087085 FORWARD MW:37588
LEEFIMTT
LOCUS 114
G1542
>G1542_STAAU8325, UNDEFINED PRODUCT 1495403:1497337 FORWARD

MW:72192
APNSRPIDFEMKKKDGTQQFYHYASSVKPARVIFTDSKPEIELGLQSGQFWRKFEVYEGDKK LPIKLVSYDTVKDYAYIRFSVSNGTKAVKIVSSTHFNNKEEKYDYTLMEFAQPIYNSADKFK TEEDYKAEKLLAPYKKAKTLERQVYELNKIQDKLPEKLKAEYKKKLEDTKKALDEQVKSAIT EFQNVQPTNEKMTDLQDTKYVVYESVENNE
SMMDTFVKHPIKTGMLNGKKYMVMETTNDDYWKDFMVEGQRVRTISKDAKNNTRTIIFPY
VEGKTLYDAIVKVHVKTIDYDGQYHVRIVDKEAFTKANTDKSNKKEQQDNSAKKEATPAT
PSKPTPSPVEKESQKQDSQKDDNKQLPSVEKENDASSESGKDKTPATKPTKGEVESSSTT
PTKVVSTTQNVAKPTTASSKTTKDVVQTSAGSSEAKDSAPLQKANIKNTNDGHTQSQNNK
NTQENKAKSLPQTGEESNKDMTLPLMALLALSSIVAFVLPRKRKN
G1543
>G1543_STAAU8325, UNDEFINED PRODUCT 1497540:1497668 REVERSE MW:4973
MAVPKRRTSKTRKNKRRTHFKISVPGMTECPNCGRIQIITPCM
G1544
>G1544_STAAU8325, UNDEFINED PRODUCT 1497751:1497846 REVERSE MW:3849
MSLLNSKQQDDSESRQVDPRLQKLQQLYDKEQ
G1546
>NONE, UNDEFINED PRODUCT 1497815:1498165 REVERSE MW:12767
DQDDVDEHYHIIKDGMVNLQDIVEDIVIIEKPMRAYSEQSDQMLTVGNGWEVIDEDQLDELA KQQATR
LOCUS 115
G2712
>NONE, UNDEFINED PRODUCT 2598712:2601288 REVERSE MW:94980
EVGDRYYNRTIIYTVYLNYNVDFKRRQYTLAKFLYKMGTFIAKHKWSAVIAWIVIVAAIL
IPLATNAPKFDNDIKMTGLESLDTNKKIEKHFNQDSEKAQIRVVFKTTKDDGIVQPNITK
DIKKTLDDIKKDDKHIDKISD
G2713
>G2713_STAAU8325, UNDEFINED PRODUCT 2601346:2601891 FORWARD MW:21879
MKETDLRVIKTKKALSSSLLQLLEQQLFQTITVNQICDNALVHRTTFYKHFYDKYDLLEY
LFNQLTKDYFARDISDRLNHPFQTMSDTINNKEDLREIAEFQEEDAEFNKVLKNVCIKIM
HNDIKNNRDRIDIDSDIPDNLIFYIYDSLIEGFIHWIKDEKIDWPGEDIDNIFHRLINIK
IK
G2714
>G2714_STAAU8325, UNDEFINED PRODUCT 2601974:2602138 REVERSE MW:6456
VRYVISIIMGIVLAIWSFKQLSQSHLDSGFIFFFIVYVLCISCFNSDKHDKNKKR

G2715
>G2715_STAAU8325, UNDEFINED PRODUCT 2602253:2603800 REVERSE MW:57130
GSRATGTRIYERSAVVQEGQNFLKRVIAEMGGKDAIVVDEN
IDTDMAAEAIVTSAFGFSGQKCSACSRAIVHKDVYDEVLEKSIKLTKELTLGNTVDNTYM
GPVINKKQFDKIKNYIEIGKEEGKLEQGGGTDDSKGYFVEPTIISGLKSKDRIMQEEIFG
PVVGFVKVNDFDEAIEVANDTDYGLTGAVITNNREHWIKAVNEFDVGNLYLNRGCTSAVV
GYHPFGGFKMSGTDAKTGSPDYLLHFLEQKVVSEMF
TABLE 9 DNA SEQUENCES STAPHYLOCCOCUS EPIDERMIDIS
LOCUS 1:
GATCGCCTTTACCTGAAACTGTTCCAGCCACTTGATTATATGTGCCCCAAGGTACTGTGTGT
AATTTAACACCAGGTTTGACGTTGTATGTTTGATTGATTTTTACAGGTGATTTAGCTGTGTT
GTAAATGACCTCATCTTGTTTTACCCAACCATAATTTGTACCAGTATTATAATCACCAACAA
GATAGAATTTTTTATCACCAAGTGTGGCAGCTTTCGTCACTGACAATGTACGTTGGATTTGA
TTTGTTGTCTTTCCTTTAGTGTCATAAACTGTAGTATATAAGCCACTATTTTTTGCATTGAT
TTGAGCAACACCACTATTGTTAGTCACTGTTAATTGGTTGTTTGTTGAAGGTTTAGTTGGAT
TGCTAGGTTTAGATGCTGTAGTTAAGTAATATTTACTAATCCAACCAGATTTACC
ATTCACTGTACCATAAAGATACGTTGCTTTATCAATTTGTTGCTGTTTAGTTGCTTTAAA
TGTTTGATTTCCAGTACCAGATACTTTGCTAGCAACTTGTTTTGGTGTACCCCAAGGAAC
TGTGTAAAGTGTTGACCCTGCTTTAACATTATATGTTTGATTCACTTTTACTGGTGCCTT
AGCAGTGTTATAAACAACATCACCTTGTTTAACCCAACCGTATTTTTTACCGCTATTGTA
GTCTTCAACTAAATAGAATTTGTTATTTCCTAATGTTGCAGTTTTAGTAACGGATAGAGT
TTTTTGTACTTGATCAGTCTTATGACCTTTACTGTCATAAACAGTTGTATATAAGCCATT
ATTTGTTGGTTTAATTTGAGCAACACCACGATTAGCAGACACAGTTAACTTATTATTAGT
TCCTCCTGATGGTTTAGAAGGTTGTGACGGTTTTGTAGATGTTGTGCCCCAAGGTGCTAC
TTGCTTCGTTTTAATTAAATATTTTTCATAAATTAAGTCATATAATTCTGCATAGCTATA
ATTGTGACTTCTTAAATATTGGTGAGGGTCAGCGTGATCAGTACCTCCTAAGAAGTTAGA
GATAGCAGCATGTGTCCAAACTGTTCCTCTTCCATCGTTTTCAGCGCTATCAGGTTTTAA
ATTATAATATTGCAATTGCGTTGCAGCATAATCAGCGTAGTTGTTCATTGAACGTGCAAA
TGAATCATAATCATGTGTATGGACGATTTCAACATTGATAAAACGTTGATTTCCATATGG
ACCTGCACCCCAAGATAAGTAATCTGTCGGAGCTGTTTCTATAATTCTATTGCCATCAAC
AAATGCGTGTACGAATGCATTTGTGTAATTACGTTTCATGAAAGCAATCTCGCCATCGAT
TGTTGAGTTATCATTTGCAGTATCATGAACAACGATACCTTCAGGACGTCCCACACCGTT
TCTATAGCCATATTTAGGGAAATATGACGTATAATCTTCTTCAATTCTTGGTGCTTTCAT
ATTCTTTTTACGAATATAGTTATTTATTGAAGAATTAACCTTTGGTGTATATTTCGGTAA
TGATGATGTTTTTTGACTAGATACAGAATAAACTGTTCTCGGTTGAGCAGTTGCACTAAA
TGGGGTGAATTGCTTTGTATCTATAGTCGCTTGATTAGATGCCGTTTCTTTTTTTACAGT
ATTAGTTGTTACACGTTGAGCTGGTTCTTTATATTTATATGAAGTAGTTTGTTTAGATGT
AGCATTCACATTGTTTAATGAGATAGGCTCTAAATGGTCTGTTGAGCTATCATCGTCTTC
ATCATCGTAATCAAAATTATAACCAGATGCGTTTGTATTTGATACTTTAGGTGTAGCAGT
TTCATTTTGTTCAGAAGTTACTTGCTGACTTTTTTGTTGGCTTTCATTATCATTAGAAGC
AGTTTGAGTTTCAATTGCTTGATTTTCGGAAGGTTGACTTGCAGTCATCTTCTTGTCTTG
TTGTTCATTATTTGCGTTAGCTCCTAAATCTTTCTCATTTTCTTTTGCTACAGATTGTGT
CTCCTGTAATTGATTTGTATCAGTGGATGTTTTATCTTCTTGTGTCAAATCATTTGTTTC
TTCTTGTTGATTTTTTGTAACAGAATTCGTTTGATTTTGATTCGCATCATCTGTTGATAA
AGATTGTTGCTTTTGATTTGATGAAATTTCATTATAAGTACTCATTTCATCTAATGATGC
ATCATATGTAGTACTTTGTGTGTCTTGTTTAGGTTGAACTTGGGTAGGGTCTTGATATGT
TTGTGTACCAGATACATTTGTAGTTGATTGTGTAACTTCGCTTTTAGCTTTTTCTGCTTG

TTTGAGGGCAGTTTGATC

LOCUS 2:

GATCATATATTATGACGTAACCTTCATCATCTATTTCAGCTATATCTCCAGT
TTGAAAATACCCATCATTATCAAATGTGTCTTTTAAATATTTGGGATATAAATAACCATT
CATCACATTTTCACCTTTAATTAATAACTCTCCATGTCCATATGCGTTGGGATTTTTTAT
TTTCACTTCGACATTTTCACTTGGTTTTCCAACAGTATCGAAACGTTCTTTGAGCATTTG
AGGTGAGGCTGTTAGAAACTGAGAGCAAGTTTCTGTCATACCAAAAGAATTATATACAGG
TAAACGATAAGTCAATGCTTGCTCAATTAATTGTGGTGATAATTTAGCACCACCTAGCAG
AATTTTTTCTAAAGAAAATGGTTGAGTCAATCCTGCATCCATTAACCACTTTAACGTTTG
TGGAACAAGGGACATATGGGTGATTGGATAAGTCTTTATTTGTGTTAACATATCATCAGT
TTGAAACTTTTTAACAAGTCTGACAGTGAATCCTTCTATCACTGCGCGCAAAATAACACT
GAGCCCAGAAATATGATATATAGGTAAGACCGAAAGCCACACAGTATTTTGTTCGAATCC
TAAACTTTGTTTACAGCCTTTAGCACTGGCTAAATGATTATTAAACGTTTGAGGCACAGC
TTTTTGAGGTCCCGTCGTTCCAGACGTAAACATAATTGATGCAATCGATTCTAAATTAAA
TTTGTAACCTGAAACATCATGTTTATCTAATTGTGTTAAATCATTAAAATGATATAAATT
AAACCCTTCTAATTCTAAAGGCAACGTGTGTACAATCGTTGCTATGTCGACTGAATTCAT
TTGATTTATCATCTCATGTCGCGTTAAACGTGTATTTATCATAGCTATTTCAATATGAGC
TAACCAACAAGCATGAATCAAAACAACTGAATCAATATCATTGCTTATATATAAACCAAT
CCTTTTCTGATTTAAAGAAGTTAAATATTCCGCGATTGTTTTTGCACGATGATATAATTC
TTCGTACGTTAAAGATAACTGATTTGTAACAATCGCTAATCGATTTCCATTTGATTGAGC
TTGTTCCTGTAACCAAAAATTCACAATGCATTCCTCCAAATTATATACACGTATAATTAT
ACCTACTTGCTTATTAAATATCAGTAGTTGAGCTTAATATGTTATTTTCAACTTAAAGTA
ATACGTCCAAAAGTCAATCCCCTATTGAAAATGTGGACTACATGCGTCAACTATAAGTCT
TTAATGTAATCATGCTTTTAAGTTAGTAACCTACGCAACTTTCATTATCACATTTCAATT
AATAATGTGCTCTATTTATTTTCATCAATCATTCTATTATTAACTATATATACATTTTTA
TAAGAATCGTTCTCTTTTCAAAAAGAATCACCTCATGAATTCATTATTTAATATATTTTA
TTTATATAATATTGTAACACCGTTTAGTTTGTTATATTTTTAAATTACTTTATATAACAC
TATGGGGTTTTATATGAGTACCGAAATTGTTAAATACTTTTTCCGAGATATTTCACCGAA
TAATAAACTATAGATTGAAGGGAAATAGATGAAGCTACAAAACTCACTCATTCTAACATT
CCAATAGGAATAAAGAGAATTTAAACTGTAACTGATAATGTTTAATGTTACTAAATTAAC
AGAATAAAACTTCGTAATGAAAAACAATCAAATTATCACTTATATTACACCTGATGTTAC
TGAAGATGAAATGAGAGAAATTATAGCTTTTATGGATTAATAAAAACAAAAGAAAAATAG
CGATAAATAAAGAGAGACGCTTATATTACTAATTTACACTTTAGTATGATTACGTCTCTT
TTTTATATATAAAATTACGCATAATTTAAACCTTCATATAGGAGTTGATTTTATAAATAT
AATCAATATGCAATTTCTAAAACTAAATAAGGAGTGAGAATTATGCATCAATATAAGGAG
TTGATTGATGATATAGATATTAAATATATTGAAATGCCAAATAAATTAGAATGAGTCATT
TTAGGTAGTGAATTATATGTTAACAGTAAATTATCATCAAGTTCTTATGTGAGAGAAGAC
ATCAACACTTACTATGTACTATGTGAAAAGTAATTTAACTAACGCACTAATCTCTTTAAA
TCAAATTGAAAAAGCAATCAACGCTCACGATTGCAAAACACTTCAAGACTTGAGTAATTA
CTTTAACTTACCTACTACACATTTATTTCTAACAATGTGATTCTATAACCTTAAATATAC
AAATTTGCTTTTTTCAATATATTAAAAATTAAACCTGCTACTTTTCATCAAATAGATACA
CAGGAGGACGTTTTATGCAACAAGAAACGACATCATGGTACAAACAAGAATGGTTTATAG
TTTTATCACTTTTATTCATTTTTCCACTAGGTTTATTTCTCATGTGGAAATTTAGCAAGT
GGCCATCTATTGCAAGAACAATCATTACTGTTGCAATTTCAGTTATCGTATTAGCAAGCA
TTACCTATTATGGTAATCTACAAATGATTGTACCAGCAACATCAAATTCAAATAACGAAA
CTAAAGAAACTACAGAGAATAATGTAAATGATAAAGACGAGCGAAATCATAAAACTGCAG
TAGAAGAAACAAAAACTAATTATGACTCCACCAAAGAAAATACTAAAGAACCTGGAAAAG
AAAATGAATCTGCAACACGATTGGAGAACTCTGCGCTTGAAAAGGCAAAGTCATATTATG
ATGATTTTCACATGTCTAAACTAGGAATTTATGATATTTTAACATCTGAATATGGAGAAA
AATTTGATAAAGAAGATGCACAATATGCTATAGATC

LOCUS 3:

GATCTTATCTGATAATTTGACACTTA
AGTCAACATCGCTTGGTAAAACATCTGATGCAGCTGGAATGAGTAACACGTCGTCGAATG
TTAAAGATTCTTTAGCAAATTTATTTTCCCACATTAAAAACAGCCTCCAATTTTATTTAT
ACTTAGTTACATTATTTCACATTTTCTTCAGTTTGTTTATACTTTATACCATTAAAAAAG
AAATTTAAGATGATTGCAGAAATTGCGCCAAGCACTATACCATTTTGAGTTAACCAAGCA
AATTGTTCTCCTAATCCTTTAAATGCTTGAGGTACTGCACTAATACCAGCACCTAACCCT
ACTGAAATTGCAATAATTAATAAATTATTTTGATTTTGGAAATTAATGTTACCCAAAATA
CTAACGCCGTATGCCATAACCATTCCAAACATTGCTATCATTGCTCCACCTAAAACCGGC
AATGGAATAATATTAGCTAAAGCACCTAATTTAGGTATACAACCGCAAATTAGTAAAAGA
ATAACCATTCCATATATCACATTGTTCTTTTTAGCTCCTGATAAAGAAACAAGACCTACA
TTTTGGGAATATGCAGTGTAAGGGAACGCATTAAATATTGAACCTAAAATGATTGCTAGA
CCTTCCGCAGTGTACCCTTTTCGAAAATCTTTTCTTTCTAGTTTTCTACCAGTAATTTCA
CTCAGTGCATGATAGACACCAGTAGATTCAATTAAACTTACAACTGCAACAATGAAAAAT
ACAAGTATTGAGCTGACATCAAATCCGAAGCCAGAAAATCTGAATGGCACAGGGAAACCA
AACCAATGTGCATCACCCACTTGTTTGATATCAACCATTCCAAATATACCAGCTAAAGCA
GTACCTATTGCTAATCCTATAAGTATCGCAATTGATTTCAAGAAGCCCTTTGTAAATCTT
TGCAAAATAAGAATAATGAGTAGTGTAACACCACCTAATATTAAATTCTTAGTATCGCCA
TAGTTTTTCGCTCCTTCACCACCTGCCAAGTAATTCATTGCAACTGGCATTAAATTGATT
CCAATAATTGTCACAACACTTCCTGTTACAACAGGTGGAAAGAATTTAACTAAATAAGAG
AAAAAAGGTGCAATTAAAACAACTAAGATACCGGATATTAAAAGCGAACCATATAAAACA
TCAAGTCCTTTCGTTTGACCGATGAGTATCATAGGTGCAACGGCAGTAAACGTACATCCT
AGTACAATCGGTAATCCAGTCCCTGTGACTTTATTTGCTTGAAGAAATGTCGCTACCCCG
CACATAAATATATCAACAGTAACTAGATAAGCAATTTCTTCAGCTGAAAATTTTAAGCTT
GTCCCCACAATAATAGGAACAAGAATAGCCCCTGCATACATCGCTAACAAATGTTGCACA
CTTAATATGAAATTTTTCATTACGCTTCACCTAAAAGAGTTACCTTATTGCCTTTTAATG
AAGCTACCTTACAAAGTGAAGATACATATAAGCCTGCATCTTCTAAACGTTGGCGACCAT
TTTGGAAACTTTTTTCAACCACAATACCCACGCCAACTGTCGTCGCATTTGCTTGTTTTA
CAATGTCATTAAGACCTAGCGAAGCATCACCATTAGCTAAAAAGTCATCAATGATAAGTA
CTTTATCGTCTGCACCTAAAAATTCTTCAGATACAATGACTGTACTCGTTTTATTTTTTG
TAAATGAATGAATATCCGTGCTATAAAAGCCATCTTTCAAAGTACTAGGTTTAGCTTTTT
TAGCAAATAGACAAGGAACATCAAAATGAAAAGAAGCCATAATAGCAGGCGCAATACCAG
AAGCTTCAATAGTTAAAATTTTAGTAATACCAGCGTCTTTGAAAGACTCATAAAATGTTT
TACCTACATCATTCATCAACTTTGCATCAATTTGATGATTTAAAAATCCATCTACCTTCA
AAATTTTCTCATCGATGACAACGCCATCTTCTTTGACTTTTCGTCCTAACGACTCCACTC
AAAAAACCTCCTCAAGTAAATTCAAATTCGATTCCTAGATACAAAAAAACCTCAAACTAC
CATTAATAGTTTCAGGATC
LOCUS 4:
GATCCTGGTAAAGCGATTATGACAATTAAATAAAGCCT
ATAAGAATAACTTAATGGCTAAAACAAATAAGTCTGGGACAAGGATATATTATGTCCCAG
ACTTTCTTTATGTATATACAGATTCTTATGAGATGAGTCCAACACAGAGAATTTCCGAAG
AAATTCCACGGACAAAGCAAGTTGGGGTTGGGGAGAAGACAGGGGACAATGAATTCTATC
CTAGTTTAGCGTTCATTTTAATAAGGGGAATTTTACAAAGTTGACAAGCGTGATAATTAT
AGGCAATGTTGATATTGGACATATCATTTTAAAGAGAAAGGAAAGATGGTAATCATGGAT
GACTTGAAACAAAATCAATCTTCTAACGAAAAACCTAAAGGTAATAAAATAATTAATATT
TTGATATTCATCGGAATGATTTTATTAATTCAAATACCTATTGGCGTGTCACTAATAGCT
TTACCTTTTTCAGTGAAATTCAGTAAGTTAACATCCATCGCATTAAGTATGCTAATAACT
GGTACAGCACTATTAATCATATGGTTAGTTAGGAATTATTATTTGAGTCATACATATGAA
AGACAATATCAATCAATGAGGGGAAAAGATATCTTTATTAATATTGGTTTTCTGGTATTA
TCAATGGTTTTTAGTATTCTAAGTAGTGTATTAATGGTCATATTTACTGGCAACGATACT
ACAGCGAATGAGAAAGAAATCAATGAAAGTTTAGATTTACTTTTACAAAAAGACCATTTA
CCACATATTTCAATTGTTGCAACTGTTGTTTTAATGATATGTATTATAGGTCCGTATTTA
GAGGAATTACTCTTCCGAGGAATTTTTAAAGAAACATTATTTATGAAATATCGATTTTGG
CTACCATTCATTATATCTTCTATTATTTTTAGTTCACAACATTTATCAACAAATATATTT

TCATATGCAATTTATTTTCTAATGGGTTGTGTATTATACCTTGCCTATAACAGAAGACGT
AATATCAAAGATAGTATGATGGTTCACATGTTGAATAATTCTGTTTCAACATTACCGGTA
TTTGTTGGTTATTTATGGCTATATTTTAGATAGTAAACATAACAATAAAGACCTGATTAA
AAGTAGATTTATCTTTTAATCAGGTCAATTTTATATGTTAAATTGTGATATCATTCTCTA
TGATTAATTTAATCGCTTTATGATCTGTTGCATTTCTAAATAAATCATAGGCACTTTCGA
TTTCACTCAGTTTACTATAATGTGTCACGAGTTGTTCTGGTTGTATTATTTTGCTTTTTA
ACGCTTCAAGTAATTCTTCAGTTGTATTTCCTGAAACTAAACCAGTAGTTACGTTAATAT
TTTTAATCCATAATTTATCTATATCAAGTTGTACAGGTAACCCATGCACACCAACATTAG
CAATCGTACCATCGACACCAATTAAATTTTGACATAAATCAAAGGTTTGTGGAATTCCGA
CAGCTTCAATAGCAACATCAACACCACGTGGATTTAACGATTTTACCTTTTTAATTGCGG
TTTCAGTCTCTTTAGAGTTAATTAAATGCGTAGCACCTAGTTCTTTAGCGGTTTCTAATC
TATTATCATCTAAATCAATCATAATAATTTTTGAAGGTGAATAGAATTGTGCTGTAAGTA
ATGCTGCTAAACCTACAGGACCAGCACCTACAATGGCTACTGTACAGCCAGGTTTAACTT
TACCTTTTAAAACACCAATTTCATAACCTGTTGGAAGTATATCTGATAACATTACAAGGG
CGTCTTCTTTTAAATTTGAAGGGGCGTGATATAAAGAATTATCTGCAAAAGGAACTTTAA
CATATTCTGCTTGAGTACCATTCACTAAATGTCCTAATATCCATCCTCCTCCGTTTTCAC
AATGTGCATAGATACCTTTTTTGCAATAGTAGCATTTGCCACATGATGAAATGCAAGAGA
TAATCACTTTATCTCCAACTTTGAAGTTGTTAACGTTGTCACCAATTTCTTCAATGATTC
CAATACCTTCGTGACCTAGTGTCGTATGTGATTTAACTTCAGGTGTATCTCCTTTTATGA
TATGAAGATC
LOCUS 5:
GATCAATTACTTGTTAATATATTACAACCA
TACGAACAACACATAAAACAAGAAAATCGTACACTTGAAGTTAATTTCTGCACAGATATT
GATGCATTCTACCAGTATCGACCTCCAATCGAACGTATTTTGACCAATTTACTAGATAAT
GCATTAAAATTTTCTAATTCTGGTAGCCGTATTGATATTATTATTTCTGAGTGTAAAGAA
AACGACGTCATTAGTATTTCAATAAAAGATGAGGGCATAGGTATCGTTCCAGAACTTCAA
TCACGTATCTTTGAAAGAACGTTTAGAGTTGAAGATTCTCGAAATACTAAGACTGGTGGT
TCGGGGTTAGGATTATACATTGCAAATGAGTTAGCACAACAAATTGACGCCTCTATTACA
GTCCAAAGTGATTTAGACATTGGAACCACGATGACACTTACCTTAAAAAAATTTCAATTT
AAAAAGTAATTTGTATTGCATTAAAAAACCGAATGTAGCTGGAATGAGTTTGAACACTCT
AGCTACATTCGGTTTTCATTAATGTACACGCTCTTTAAAACCTTCATCTTGAGAATAATT
TGATGCATACGTATCACTATATGTTTTAACTTTATAAAAAGAACTTAATTTATATAAATC
ATTACTACGCTTGTTGTTTCTATTTTTATTCAGGTTTAAAGCATTATATCTCATGTCGAG
ATTCTCAGTCTGAATATTAGAGTTTTCAACAATATACTTCGGTCTATGTTTAACTTCATA
ATAAATACGACCAATATATTCTCCTACTACGCCAATAGACATTAATTGAATACCACCCAA
CAATAATATAGCAGCAATCGTAGTAAAATAACCAGGTATATTTATACCATTAATCAAAAT
ATTTATTAATAAATAAATTATATATAAAATACTGATAGAAAACGTGAACATACCTAAGTA
TATCATCATGCGTAAAGGCTTATTGTTAAAAGAGATGAGTCCATCAATACCATAGTTGAG
TAACTTTCTAAAAGTCCACTTAGATTCTCCATCTTCACGCGTCACATTTTCATATTGAAA
TACTTTTGTTTCATAACCTATCCATTCAAATAGACCCTTAGAGAAACGATTATATTCATC
AAGTGTTGTTAAAGCTTGAACTGCACGTCGACTGAGTAATCTAAAATCACCAACGCCGTC
TTCAAATTGGATATCCTCTACAAATGCATTAATTAATTTATAATAACAACGAGACAAAGT
TTTACGTACAAAATTCTCTCCCTGACGATTTCTCTTAGCAACCACTTGATCATAACCTTC
AATGTAACCCTCTATCATTTGTGGAATATATTCAGGCGGATGTTGTAAATCTCCATCAAT
CATAATCACCGCGTCGTGCATTGTGCTATGCTGATAGCCAGCAATCATTGCAGCTTCTTT
GCCAAAGTTTCGACTGAATGAAAGATATTTAACATGGTTATCATACGCAACAATATTCTT
GATATGATGTATTGTCGTATCTGTACTACCATCGTTAATAAAGAGTAAATCGTATTCATA
ATTTTTGATTAAACTATCTTTCTTCATTATTTCAGTTAATTTGTCATAAGTTTTCAAAAC
GACTTCGCCTTCATTATAGCAAGGGACGATGACTCTGATTTTCATTAAATGACATCCTTT
TCTCTGAACTATTTGCTATCATTTTATCAATTTCCTTGTCATACATTCTAGTTAAATACT
GTGTATTTACATAATCTTAAATTAAGCTTAATAGTTTTAAATATTTTCTTTTATGAGCAT
CACATTAACTTTTAGTAAAAAGAATTTAATTATTTTTTTAAAGTTAACTCTAACTGATTA

ATTATATTTATTTCAAATCTCCAATACTGACATCATCAGGATC
LOCUS 6:
GATCAGTTGATTGGTGTGTCGATTGTGACATTA
TAATAACTCCTTTTCTATATTAAATAATTAGGTAATAAAAATTTTACAACACTATAAAGA
ATTACAAAAGTATTTAAGTTCATAAATTCTAAATATATAGAAGTTTTAGAAAACTCATTA
CATTGAACTTTACTTTATTACAATTTATCTAATAAATATTAAGAAAAGTAACGAAATATG
TCTTATAAATAGCGATATATCAACTTTCTTTAATAAATGTTCAGAACAATACATTATTTT
AACAATGTTACAAGATAATAACAAAGCCCACAAAGTCAAATATTTTTGTTAGTATGGGGT
ACGTAATAAAAAAACAAAAAGTTAATGTACAGAGACTTGTCGGGACAATTATCTAAATCA
TTAAACTTAAATCAATTAAATCTTTGTTATATTTAAGGAGGAGTTACTTTGAAAAAGTTA
GCCTTTGCAATTACAGCCGCTTCAGGCGCAGCAGCAGTTCTATCACATCATGATGCTGAA
GCTTCTACACAACATAAGGTTCAATCTGGAGAATCCTTATGGACTATTGCACAACAATAC
AATACTTCAGTAGAAAGCATTAAGCAGAATAATAATCTTAGCAACAATATGGTATTCCCA
GGACAAGTTATTAATGTAGGTGGAAGTGCTTCACAAAATACTAGTTCAAACACTTCTTCA
AGTTCAGCATCTTCACATACTGTAGTAGCAGGTGAATCATTAAACATCATAGCTAATAAA
TATGGTGTTTCAGTTGATGCATTAATGCAAGCAAATCATCTAAATGGTTATTTAATTATG
CCTAACCAAATATTAACTATCCCTAATGGTGGTTCTGGTTCAGGATCAGGTGGTACAGCA
ACTCAAACTAGCGGTAATTATACTTCACCTTCATTCAACCATCAAAACTTATACACTGAA
GGTCAATGCACATGGTATGTGTTCGACAAACGTTCACAAGCTGGTAAACCTATCAGTACT
TACTGGTCTGATGCAAAATACTGGGCGTCAAATGCAGCGAATGATGGTTATCAAGTTGAT
AATACTCCATCTGTTGGTGCAATTATGCAAAGTACACCTGGACCATATGGTCATGTAGCA
TACGTTGAACGTATTAATGGTGATGGTAGTATTTTAATTTCAGAAATGAATTATGCAAAT
GGTCCATACAATATGAACTATCGTACTATCCCAGCTTCAGAAGTATCTTCATATGCATTT
ATCCACTAATCATTGATGATTAATGATTTTACTACAAGGTAATGGAATATACCTTGTAGT
TTTTTATTTTAATAGAATGATTGAACCTCATTATTTTATATTTTAAGCAATTCAAATAAA
AAGGCCACACAAAGTTGACTAAAAATGTCAGTCTTTGTGTGGCCTTTAGCTATATGTACT
TACGTATTATACAAACCTTTTTTATTTTAAGAACAGATGAATAATAAAATAAATAATTGC
TGCTAAAACAGCTGAGATAGGTAAAGTAATCACCCATGTTACAACCATACGTTGAGCAGT
ACTCCATTTAACACCTTTCGCACGATTTGAAGCACCTACACCTAGAATAGATGAAGACAC
AACGTGTGTAGTAGATAATGGGAAATGTAATGATGACGCTACGAAAATCGTTAATGCTGA
AGAAATATCAGCGGCTGCACCGTTAGCAGGTCTAATTTTCATAATATTTCCGCCAACAGT
TTTGATGATTTTCCAACCACCTACTGCTGTACCTAATCCCATAGCTGTTGCACACGCAAC
TTTAACCCATACTTGAGGTTCAACATTACTACCATCTTGTAAATTACCTACAATTAAAGC
TAATGTGATAATACCCATAGATTTTTGAGCATCGTTTGTACCATGTGAGAATGATTGTAA
TGCTGCAGTAAAGATTTGGAAAAACCTAAAATTACGATTAGTACGTGTTAAATTTGAATT
TTTAAAAACGATTTTAACAATCGTATACATCATATAACCTACACAAAAAGCTATAATTGG
TGAAATGATTAATACGATAATAATTTTTGTAAAACCTTGATAGTGTAATACTGCAAACGA
ACCTTGCGATGCAATGGCTGCACCCGCTATAGATC
LOCUS 7:
GATCATATTATTAGAGCTTAT
CACAAGTTTTTGCAAAGTGGTTACCAAACAGAATTACATTTATTTGGTAGAGATGAAGAT
AATCAAATTCCATTGATGAATACTTTGATTTCAGAATTAAAATTATCGGATAAAGTTAAA
ATATTTAAATATACCAATCAACCTTTACAAGAATTTAAGAATTCTAAAGCCTCTCTACTT
ACAAGTCAATATGAGGGATTTGGCTTAACACTTATGGAAAGTATAGAAATGGGGTGTCCA
GTCCTATCTTATAACGTTCGTTACGGTCCAAGTGAAATTATTCAAAACGGGATAAATGGC
TATCTCATTGAAAAAAATGATATTGATAGTTTATCAAAACATATGATTAACATCATTGAG
CACCCACTACAAAAAGTGAAAAATAAAGACACTTTAAAATATAACGCCGCAGTGAATAAT
TACAAACAACTTATGCAAAGCTTAGACTTATTAAAATAGTCAAGTTTTCCGATATTATAA
AGATTTGGTAGCATCTTTATAAAACTATAATTAAGCCCATTGATGATTCTTAATCCAATC
ATCAATGGGCTTAATTTGATAGTTATATATTGTTAAACAATTTTCTTAATGAATAAATTT
GTAATTTCTCACTTGATAAGCTGGAATTGTTCTATATGTCATATTTCCAGGAGCTGCACT
CCAGTTCATTTCTGAAACTAAAATACTTCCATCGCTATTCACGCGCTCTACAAACGCTAC

GTGACCATAGTAACCAGCGTCAGTTTGTGCAATTGAGCCTACTGTAGGACGATAATCAAT
AGTATATCCATCAGCAGCTGATGCATTGTCCCAATTATTTGCATTCCACCAGTATGTACT
GATACCTTTTCCTATTTCAGCACGTCTATTAAATACGTGCCATGTGCATTGTCCCCAAGT
ATACAAGTTTTGATGGTTAAAAGTTGGTGAATAATAGCCACCGTTTGATCTAGTATTATT
AGAAGATGAGCTACTAGAACTACCTCCAGGCACTTTTAACTTCTGTCCAGGATAGATAAA
GAAATTAGTTAATCCATTTAATTGCATAATTTTTTGATACGTTGTCCCATATTTACTAGC
AATTGCAGATAGTGAGTCTCCATACTTAACAGTATATGTTGCAGTACGACCACTAGACCC
ACTAGCTTTTGCACGACTGGAACTCGTCGCTTTACCAGAAACTTTCAACTTTTGTCCAGG
GAAAATAAGATAGTTATTTAACCCATTAAGTTGCATGATTTTTTGATAAGTTGTACCGTA
TTTTGCAGCAATAGAAGATAATGAATCTCCAGCTTTAACTGTATAAACTGTGCCACTATT
TGTTGACGTTGCTCTTGAAGATGAGCCTGATACTTTCAATACTTGATTAGGGAATATTAA
ATTGGAAGTCAATCCATTAAGTGATTTTAATTTAGCAATACTAATCCCATATTTGTGAGA
AATTGACCATACAGATTCTCCACTTTTTACTGTATGCGTTGTTGCAGCTTGTGCATGAGT
TGATGCCAATGCGCTAAGGGCAGTTGTTCCAATAATGGCAGTAATATATTTTTTTTGCAC
TTGAAATCCTCCTCTACTTTAGGTTTTGTTTATTCGCGTTTTAACAATACAAAGATATTA
TACTCTTTAATTATGTATAGCATGTTTGCTTTAGATGACATTCTGATTACAAATATTATT
TTAAATAAAAAATAGGGCTACGCTCAAACATATTTGCATTTATCCAATTTAATACATTTT
GCAGTCAATTACAATGTCTTTTTTATCACAATTATTATTAATATGGTTTCGCACCTTATA
TTTACAATTTCGAATGTAATGTTTTTTCTATTTTCAAATTAATATTAAATGGACAGACGC
TTATTTCTAGATTCTAAATGCAACATTTCGAATAAAAAAAGAAGTAGGAATAGAATTCGC
TATGAATTCTTTATCCCACTTCAAAAAGGTAAAATGCCATGAAAGATATAGAAATATATC
TTCAACTTAGTCATTGACTATAAAATTGTTTTGCAACCATCACATATAACTGGAATTCTA
GACTAAAAATTTCTATATGGTGAATGTTGCGCTAAAACTTTATATTATTTTTTTGCCAAC
TCATTTTCGATTTCTTCGATTTCCTTTTTAGAAAGATC
LOCUS 8:
GATCAATTCAGAGAAGCAATGACAAAATTC
CCAGTTTGGATGGGTGCTACTACCCTATTCTTCGGTGCCATAAATGGTGCTAAAGAAATG
CTTGATGTAATTACTGAAATTGATGGAAAAATGATTACTCTTGCAAAAGTTACTGGTGAT
GACAATGCACTTCAACAAACATTTATTGACGCAAATAATGCTGCTTCTCAATTCGGACAG
ACATTAGGAAGCGTATTAGATGTATATGCAGAATTCGCTAGACAAGGTGTTAAAGGTAAT
GAGTTATCTCAATTCTCAAATGCAGCATTAATTGCTGCTAACGTTGGTGAGATTGACGCT
AAACAAGCTTCTGAATATTTAACTTCTATGTCTGCTCAGTGGGAAACGACTGGAAACCAA
GCTATGAGACAAGTTGACTCACTCAACGAAGTTTCCAATAAATATGCTACAACTGTTGAA
AAGTTAGCACAAGGTCAAGCAAAAGCTGGCTCTACTGCTAAATCAATGGGACTTACTTTT
GATGAAACTAATGGTATTATTGGTGCATTAACAGCTAAGACTAAGCAATCTGGGGACGAA
ATTGGTAACTTTATGAAAGCCACTTTACCTAAACTTTATAGTGGTAAAGGTAAATCAACT
ATTGAAGGCTTAGGCATTAGTATGAAAGATGAAAATGGACAATTAAAATCTGCCATTTCT
CTTTTAGAAGAAGTTTCTCAGAAAACTAAAAACTTAGAAAAAGACCAAAAAGCCGCTGTT
ATAAATGGCTTGGGTGGAACATACCACTACCAACGTATGCAAGTATTATTAGATGATTTA
TCTAAAACAGATGGCTTATATAAACAAATTAAAGAAAGTTCCGAAAGTTCAGCTGGCTCT
GCATTACAAGAGAATGCAAAATACATGGAGTCAATTGAAGCTAAAGTTAACCAAGCAAAA
ACAGCATTCGAACAATTCGCATTAGCTGTTGGTGAAACATTTGCTAAATCAGGAATGCTT
GATGGTATCAGAATGGTTACTCAACTTTTAACTGGTTTAACTCATGGAATTACTGAATTA
GGCACAACTGCTCCGATTTTCGGCATGGTTGGTGGTGCTGCCTCATTAATGAGTAAGAAT
GTTAGAAGTGGTTTTGAAGGTGCTAGAAGTAGTGTTGCTAATTATATTACTGAGGTAAAT
AAATTAGCTAAAGTTAACAATGCTGCTGGTCAAGTTGTTGGACTTCAAAAAGTTCAAACT
GGTACAGCTTCACAACTTCAGTTTAATAAAAATGGTGAATATGATAAAGCTGCTTCACAA
GCAAAGGCTGCTGAACAAGCAACTTACCAATTCTCTAAAGCTCAAAAAGATGTATCAGCT
AGTGCTATGATCGCTTCAGGTGCAATCAACAAAACAACTGTGGCTACCACAGCAAGCACT
GTTGCCACTCGTGCTGCTACACTTGCAGTTAATGGTTTAAAATTAGCCTTTAGAGGCTTG
TTGGCTGCTACTGGTGTCGGGTTAGCAATAACTGGTGTTTCTTTTGTACTGGAAAAAGTT
GTAGGTAGTTTTAATGCTGCAAGTCAAGCTGCTGAACAATATAAACAAAAACAAGAGCAA
ACGAAGCAAGCAATAGCTTCTATGAGTAATGGTGAAATTAATTCACTTATTAGTAGTTAC

GATAAACTACAACAAAAAATGAATTCTGGTAGTGCATTTAATACAGCGGAAGCTGAGAAA
TATAAAGAAGTAACAAGTCAATTAGCTAATATATTCCCCGATTTAGTTACTGGTGAAAAC
CGTTATGGTAAGGAAATGGCCGGTAATAAAGAAGTAATGAAACAGAAAATTGAGTTAATC
AAGCAAGAAATGGAGCTTGAAAGACAAAAGAATGCTATCAAACAAAAAGAAGAGCAAGAC
GCTTACATCAAAGAACAAGATAGCTTAGCTAAGAAAAACAGAGGTCAAAAATGGTATCAA
CTTGGTCAAACACCAGAGTTGAAACTTCAGGAACAAGCACGTCCTACTACTGTTTCTGAT
AATAGTAACATTAACAAAATTAATGCCACTATCCAAAAAGTGAAGAGTCAAGCCCAAGCT
GAAAAAGCATTAGAACAAGTTGATAAGCAACTTGCTCAATCTCAAACTAAGAATAGACAA
AATGAAGTTCAGCACTTACAAAAAGTTAGACAAGCTTTACAAGATTATATTACTAAAACT
GGTCAAGCAAATCAGGCAACAAGAGCTGCGGTATTAACTGCACAGCAACAATTCACTAAC
CAGATAGCAACAATGAAAAAGCTTGGTACTACTGGTCAACAAGTGATGACTACTATTTCT
AACTCAGTTGCGAAAACAGCAAAGTCTGGTAAAGCTGCTCAAGCAACCTTCAAGTCGTTT
GAAACCTCATTAGTTAAAAGCTCTTCATTCAAAAGCAAGATGGCTAGTTATGAAGCTTCT
GTTAAGAAATTTAAAAATGCTGCTAACCAATCTGCTAAAATTGCTGCTCTTAAAGACGTA
GAACGTGATTACTCTAAAGTTGCTAAAGGTATTATGCAAGCGGCAAAAGCGGCAAACATG
AGTAAATCTCAAATGAAAGATTTGAAAAAATCTCTTCAACAAAATATACAAGCAGAAACA
GGCTTTAGAGCTTCAGTAAGTAAAGCTGGTAAAGTTACTATTGATCAATCTAAGAAAATC
AAACAGAATA
LOCUS 9:
GATCAATTTTCAAATCGCCTAGTCCTAGCGCTCATCATTGTATACTCAGTT
ATGTCGTTGTGTCCCGTTCTAACATTTGCTTTTTAGTAATAATGGGGTACTTTTTGAAAA
CAATAGACCCTACAATACCAGCAATAGTTCCTATAATCGCCATAACCACACCATAGATAA
TCACTTTCGTTAAACTATTAAAACCAAACATCACTAAAAAACCTGCAATAGGTGTAGCAG
TGCCAGTTGCATTATTAATCATACCTGACCAAGCAATTATAATACCGGCAATTGCCCCAC
CAAAGAAATTAGTGACATAAATAGGAATAGGATTAGCGGAAACAATATCAGCTTGAGAAA
GCGGTTCGATTCCGACTGAAATGGTTGATTTACGGTCTCCCAATTTCAAACGATGGAACA
ATGCACTATTCATAAACGCGGAACTAAATGCGGCCATGGCACCTATAGCCATAGGCGCAC
CCGTTAAACCAAGCAATGCAGTGAGAGCCATTGAACTTAATGGAGCAGTACCTACTACTG
TAATAATACCTCCCAATACAATTCCCATAATCAACGGGTTAGCATCTGTACTACTTTGTA
TAATATCCCCAATTTTAATTAACGTGTTATTAACCACTGGCGTCAATCCAGTAGCAATTA
ACCTAGCTATAGGTGCGAGAAGAATGATTGAACCAATTAAATCAATACCGTCTGGCACAT
ATTTCTCGGTATACTTCATCATGTAGCCTACAATATACCCAGCGAAAAATCCTGGTAACA
AGTCCATACCTCCACAAGCTGCCCCAATAACTAGTGCATAAACTGGAGATACCCCAATCG
CTAATGCAGTTAATCCAGCCGCAGCCACACCACCTAAACCTCCAGCAGCATCTCCCAGTT
CTTCTAAGAATTTAATCCCAAATACTTGACCACCCACATATTTATTGAAAGCTTCAACTA
AAAACGATGCAATCGCCGCATTCGCTAAAGCTCCCATCGCCCTCATCCCACTAGGTGCTT
TGTATGTAAATAGAGTAAAAATAACTAAAACTAAAATTAAAAATAAAGTACCTATAAGCA
AATCCATATCAAACACTCCCCATAACACTTATAATTTTCTGATTTTTTAGAAAACAACTA
TAAAATACATAGTACCAAAAAAATATACCTTTGAGGAGAATTTTTTAAAAAATAGAAAAT
ATTTATTAAATTAAATAAAGTTAAATAGTAAAAATTGTGACAAGCTTCAACTTACTCTAC
CAATGGAGACATTTATTAGAATTCCTCAAATTAATCCTCCACGACATATTAATGAAATGA
TTGAAACGATACACAATCGTGATTTTGATGAATTCAGTTCTCTAAAAAGAACAATTTAAA
TTTTTAATAAATCAATCATAAATATCACCTTTTTTCAAAGCAAGATTTGTATTTGCGAGT
TCTTCCATAAATTGTGAGTCATTTAAAACATCGAATGGTTTATTACCTTCGCCTATTAAA
AATCTAAAATGAGTAATATTCATAAATTCAAATATTAATTTAAATTGGTGGACTAAAGGT
TGTGCTTTGATACGTGGACTGTCACCGCCTATGATTAAAATTAAGTTTTTTTTTGTGACAT
AATTTCTTTGAAGTTATCTATTTGCGTATCTCGCAATGATTCAGTCCATCTATCAATAAA
GAGTTTTAAAGACGCACTCATGGAATACCAATAGAGAGGCGTTGAGAAAATTATAATATC
TGATTTTAAAACTTTATTTAAAATTTTTTTATAATCATCATTATGAATGCTAGTTTCATT
GCTATGACGATTATCATTAACCTTTTCAATGTTACTTTGGTATAAATTTATAAACTTTCC
ATCAATTAGTACATTTTATTATTATCAATAGGTTTTAAAAATCCAAAGTTAAGTAGTTGA
ACTAGACCTAAAAAGACATAAATAAAAAATCAAGATC

LOCUS 10:
TTGATCCGATAACTACGCCAATGATTGTAAGTATGACAAGTGCTCGATTAGGTA
AATGTTTGTGATTCAATTGACTTAACCAAGAAGGGAGTAAACCATCTCGTCCAAATGAAT
ATAATAGACGTGAACCTGCAAGCATCATACCGATTAATGCAGTGAACATACCGATGACAG
AAATTGCTTGAACAATTGCAGCAATAATACCATGACCACTTTCTCGTAATGCCCAACCTA
CTGGCTCTGCATTATCAGCGTATTGAGAGTAGTGGAACATGCCAACAAGAACAAGTGCTA
CGGCCACAAACAATACAATTGCTACTATGAGTGACCCTAAAATTCCTCTAGGCATTGTCT
TCTGTGGATTAATCGCTTCAGCTGAATTAGCAGCAATAGAGTCAAAACCAATATAAGCTA
AGAAAATCATTGAAACTCCAGCATAAATACCTTGCCAACCTCCAAAGTCGCCAGTTTCAG
TAACCTTATGTTCTGGAATAAATGGTATATAGTTACTGAAATTAATCGCAGTTAGCCCAA
CAATCACAAATAAAATGATGGCTAACACCTTTAATATAACCAATACATTTTCCATACGAG
CGGCTTCGTTCATTCCGCGTGATAATAGTAATGCAGTTAAAATAATCACTACAGCAGCAA
TGATATCAATGACACCACCGTTACTTCCAAATGGATTAGATAATGATTTAGGTAAAGAAA
TGCCTAATGGTGCAATAAGACCTCTTAAGTTAGCAGAAAAGCCTGAAGCAACGAAAGCAA
CAGCAATAAAGTATTCTGCTAAAAGCGCCCAACCGGCAACCCATCCGAATAATTCACCAA
AAAGTACATTAATCCATGAATAAGCTGATCCAGCAAAAGGCATTGTAGATGCCATTTCTG
CATAAGTAAAGGCTACAAGACCTGCAACAATGGCAGCTAATAAGAATGATAATGCCACAG
CAGGTCCGGCATGCTCAGCCGCGACAACACCTGGTAAAGTGAAGATAGATGTAGAGACAA
TTGTACCAACACCTAGTGCAAGAAAGTCACGTACACGTAACGTGCGCTTAAGATGCCCAT
CTTTATTTTGATAAATAGTAGGATTCTCTTTTCGAGTCATCCGATTAAAAAAACTTCCCA
TAACAAACCTCCATAACATCAACTTACTATTAACATGAGTCAGCAAACATTCCTTAACAA
TACGTATTAAAAAATCATCTACATGTAGATAAAATGAATTGGCTGATTCTGATAATTAAT
ATAATAGCACAGAAGATGAATATTTTGTCTAAAAATTCTGAAAAATCAATAAAAATTATT
TTCCTCAGTGATTAAGTTAATATAGTAAAATTTCAATAGGCTAAAAAGGATATAAATTGA
ATGTTAATATCACAGGAATTTTCATTTATGGTATTTGTCATGTATTTCTTCACATGATTT
ATAAATTAGTAAAGTAATTATATTTGGAAAACATGTTATCGTAAAAGAGAGCATCATGAT
AATGATGAAAAATAATCGGTATTAGTCAATTAAAATAATTATATACACGGAAATATTGTT
TAATGAGTGTTAGTGTATATGAATAATTGAAGAAGTTATGTTAAAAAAATGCTAGATATC
AAACGATGGTTCTATGAGAGAAGTTATCCATCAATCAAATGTTGATAATTAAGGATGAAT
ATAAATGGAAATTAAACAAATTAAATATTTCGTAGAAGTTGTACGACAAGGTGGTATGAC
GCAAGCATCTGAACACTTATACATTGCACAGTCAACGATTAGCAAAGCGATTAAAAATAT
TGAAAATGAATATGATATTACATTGTTTGACCGGTCACAAAAACAAATAAAACTAACAGA
TATAGGTCAAACATTTTATGATAATAGTTTAGAATTTTTAGCTTTATTCGAGAAATTATC
TTTAGAAATGAATGACATTGTGAACGTTCAAAAAGGTCATATTAAAATAGGCTTATCACC
AATGATGAATGTTCAAATGTTTACAAATGCATTGAATCAGTTTCACAGACTCTATCCTAA
TGTGACATATGAAGTGATTGAGGGTGGTGGTAAAATTGTTGAGAACTTAACATCTAATGA
TGATGTGGATATTGGTATTACTACATTACCTGTAGATC
LOCUS 11:
GATCCTGAAACACTATTTAT
TGTGATGAGTCAAATATTATTTCATCCGCTTGTAGGTGGATTTTTATTAGCAGCCATCCT
TGCTGCAATAATGAGTACTATCTCTTCACAATTACTAGTAACATCAAGTTCTTTAACTGA
AGATTTCTATAAACTAATCAGAGGTTCAGATAAAGCATCATCACACCAAAAAGAGTTTGT
TTTGATTGGACGCTTATCAGTTCTACTTGTTGCGATAGTTGCTATTACGATTGCTTGGCA
TCCAAACGATACAATACTAAATTTAGTTGGTAATGCTTGGGCTGGTTTTGGAGCTGCATT
TAGTCCTTTAGTACTCTACTCTTTATATTGGAAAGATTTAACACGTGCAGGAGCTATTAG
CGGAATGGTAGCTGGTGCTGTAGTTGTTATTGTTTGGATTTCTTGGATAAAACCCTTGGC
TACAATCAATGCATTCTTTGGTATGTATGAAATCATTCCAGGTTTCATAGTTAGCGTATT
GATTACGTACATCGTAAGTAAATTAACAAAAAAACCTGATGATTATGTTATTGAAAATCT
TAATAAAGTTAAACACGTCGTTAAAGAATAAATGTACAATTATCAGACTATATCAAAATT
ATAATATTGATTAATTAAATAACAATTACAAGTATAATTTAAATATTTCTCTAATATACA
GTGTCAATTTATTTTATTCACATAAGAAAATAGCTATGAAGAAATCTATCAATTTAAATT
TCTTCATAGCTAATTTTTTTCATTTAAATTTATTGACGGCTTGAAAAATGAGTCAAAATC

ATCAATAACATCAAATTGCAAATATATTCCTTTGGTAATGGATTGACCATTAAACTTAAT
TCGAATTCTATTCTATTCTTTTCTATACAATGAAACGGGTGTCATACATCATCAGTAACT
AATTATGATAGATATGAACTTGTGGTTCTTTATCGTCTTTAGTTTTACTAATGAGAGCAC
GTGGAGTATTTCCATCTTTGATTCTAATTTCATACTCATCTAGTTTATCAAAATATTTTT
CGGCTTGCTCTGTAACATATTGTGTAATACCTATCGTTTCTGCCTGTCCGTAATAATCTA
TAGGCAAATCAACTGTAAGTTGTTTAGCTTTTTTATTTACGAATTTAACCTTACCAACTG
CTTGTGTGAAGTTTGAAAAATACGATTGCAAATTATCATTAAACTGTTTAAAGTTATTAT
TCAGCGTTTCATCATAATCAGCTGCAGTTGACGAAGGAATTAAGGCTGCTTTTTCATTAA
TATTATCCCAAGAGTTAATTTTAGTTTTACCCTCTTCAACCGTAGTACCAACTATAAATT
CACCTGGTGTAATGGAATCTTGACTTGATTGTTTATAGATAGCAAAATGAATAGGAATAT
CTTTCAAATCACTATTCTCACGTAAACGAGAAAGCATTTCACTAGCCATCTGTTTACCTT
GCTTTTCAATCTCTTTATCAGATAAATCTTTACTAAATGTTTCGCCATCTTTCTCTTTTT
TGTAATAATAAACACTATTCATGGCTAAACCAATTGTCATCCCTTTTATATTTTTACCTT
TAGAATCACTATTTCCATAAAAATCCTGCTCGAGTATATTTGAAAGATAGGCTGGAGAAT
TTTCAGCTATTTTCTCTTCATCTGTTTCACCATTGTGAGATGGATTGAGTCCAAGATTCT
CATTAGCATTTTTGCTTTTCTTTTCTTTTTCGCTCATCTTGTCAATTTCTTTTTTCGTAT
ACTTCGGATCTAAGTATGCATTAATCGTTTTTTTATCTAAATATTGTCCATCTTGATATA
AATACTTATTTGTTGGAAAGATTTCTTTACTTAATTCTAGTAAACCACTTTCAAAATCTT
CTCCATTATAACCATTTGCCATATTATCTTGTAATAATCCACGAGCCTGGCTTTCTTTGA
AGGGTAATATAGTCCTATAGTTATCACCTTGAACTTTTTTATCAGTCGCTATTTGTTTCA
CTTGATTTTTATTATGGTTATCCTTATGTTCACTTTGTTCTTTATCTGATGAAGTTTGTT
TATGTCCATCTCCGCAAGCCGTTAATAATAACAGTATCGACATGAGTAAAAATATTGTTC
GCTTCATTCACGTACTCCTCTAATTATTAGATTCCATTTTGTTTTTCAATAAATGCTGCT
TCAGTCCAAATTTCAGTACCATACTTCTCAGCTTTGGCTAATTTAGACCCTGCATCTGCT
CCAGCTATGACAATATCAGTACTTTTAGTCACGCTGTTTGTAACTTTAGCACCTTGCATT
TTCAACCATTCAGATGCTTCATTTCTCGTCATTTGCTCGAGTTTCCCTGTTAATACAATT
GTTTTCCCACTAAAATCAGGATGACCTTCGATTTCAGTTGTTTTAATTCCTTTATAAGAC
ATATTAACATTTTTATTACTTAATTTTTCAATTAATGAACGAATATCACTATTTTCGAGA
TATGTTACAACAGATTGTGCAAGTTTATCTCCAATATCTTGAATTTCAATTAATTCACTT
TCAGTTACTTTAAAAAGTTGATC
LOCUS 12:
GATCCTGACACAGCTATTTCTCTCTTAGATAATC
CTATTCAACCTTTACCTAATAATAAAGAAAGTATAATTAGATACATCAAAGGGGCAATCT
AGTATGGAGGAAGTTTTAAAACTTAAAATCCCTGCATCAACCGCGAATCTAGGTGTAGGT
TTTGACTCAATTGGTATGGCATTGGATAAATATTTGCATATGTCTATACGTAAGATTGAA
AGAGCTAATTGGGAATTTCTATATTATAGTTCAGAACTAGAAGGTTTACCTAAAGATGAG
AATAATTATATTTATCAAACTGCTCTAAATGTTGCGCGTAAATACAATGTTACACTTCCA
AGCTTGCAAATTGAAATGAGAAGTGATATTCCATTAGCTAGAGGACTAGGTTCATCTGCC
TCTGCATTAGTCGGTGCTCTTTTTATTGCTAATTACTTTGGTAATATTCAATTATCTAAA
TACGAATTGTTACAACTAGCGACTGAAATTGAGGGACACCCTGATAATGTAGCACCTACA
ATATATGGAGGTTTGATTGCAGGTTTTTATAATCCAATAACTAAAATAACAGATGTTGCT
AGAATAGAAGTTCCGCACGTAGATATAATTTTAACTATACCTCCATATGAGCTTCGTACA
GAAGACTCTAGAAGGGTCTTACCCGATACATTTTCACATAAAGGTGCTGTGCAAAATAGT
GCCATTAGTAACACTATGATTTGTGCTCTCATTCAGCATAAATATAAACTTGCTGGAAAG
ATGATGGAACAAGATGGTTTTCATGAACCATATAGGCAACACCTTATTCCAGAATTCAAT
CAAGTACGTAAACTATCACGTCAACATGATGCATATGCAACTGTTATCAGTGGAGCTGGA
CCTACAATACTCACTCTTTGTCCAAAAGAAAAAAGTGGTAAATTAGTTAGAACACTACGT
GAGAAAATTAATAATTGTGCTTCAGAACTAGTAACAATTAATGAAATAGGTGTTAAAGAT
GAAGTGGTGTACCTAAAGTCCTAAATTATTGTAAAATATAGTTAAGAATAAACTTTTAAT
AACTCTTGAAAGGAGTTCTATACTATATGACTCAGTATAAAATGGTAGTTTTAGATATGG
ATGATACTTTAATGAATAGTGATAATAAATTATCCATTGAGACAAAATCTTACTTATTAG
ATATTCAAAAGCGTGGTTATTATGTAGTATTGGCCTCAGGTAGACCAACAGAAGGTATGT
TACCTACTGCGAGAGAATTAGAGTTAAATAAATATAACAGCTTCATTATTAGTTATAATG

GAGGTAAAACTATAAATATGGCTAATGAAAATGTAGAGGTCGATCAGCCTGTTTCAAAGG
AAGATTTCGATAATATTGTAGATTATTGTAGAGATAAGAACTTTTTAGTACTTACTTATG
ATAATGGATATATCATTCACGATAGTAGTCATGAATATATGAACATAGAATCACAACTTA
CCGGATTACCTATGAATCGTGTTGCTGATTTGAAGGAATATATTAATCATAGTGTGCCCA
AAGTTATGGGTGTGGATTATGTAGGTCATATTACCGAAGCACGTATTGAATTGGATGGTT
ACTTCAATAATGATATTGATGTGACAACGAGTAAGCCTTTTTTCCTAGAGTTTATGGCAA
AGAATGTTTCGAAGGGGAACGCAATAAAAGCACTTTGTAAAAGATTACAAATTTCTCTAG
AAGAAGTTATAGTATTCGGGGACAGTTTGAATGATAAGTCAATGTTTGAAGTTGCTGGAT
ATTCTGTAGCAATGGGAAATGCTAGTGATGAACTCAAGAAAATTGCTGACGAGGTAACTT
TAGATAATAATTCTAACGGTATTCCTTATGCTTTAAAAGAACTTTTGGTTTAAAGTATTA
TTACAATGAATTAATATGTAAATTAATAATTTTAAGGTTAATTGAATCTGACTTCTCTAA
ATATAAGTAGTAAGTCATAAAAAACTGTCGATATAAATATAATTAAAAAATTTTCTTTTT
AATATAATATATAAGTCTGAGACATAATCTAGAATAATAGCCCGTAAATGAATTTTCAAA
ATTTATTTACGGGCTTCTTTATTCATAATATAAGTTACATAATTAACCTTCATCCATGCC
TACAATTTCTTTATTGAATATATTTAAATCTTTATTTACTTTTTCTTTCAAATCAATTGA
AAATCGAGACTTTCAATTGATTTGCTATTTCGCAGTATGTGTCCAGTCATGTTTTCCTTT
ATAGCGTTTAACATGTGCATATACTTGATC

TABLE 10 PROTEIN SEQUENCE STAPHYLOCOCCUS EPIDERMIDIS

LOCUS 1:
ORF1:
DQTALKQAEKAKSEVTQSTTNVSGTQTYQDPTQVQPKQDTQSTTYDASLDEMSTYNEISS
NQKQQSLSTDDANQNQTNSVTKNQQEETNDLTQEDKTSTDTNQLQETQSVAKENEKDLGA
NANNEQQDKKMTASQPSENQAIETQTASNDNESQQKSQQVTSEQNETATPKVSNTNASGY
NFDYDDEDDDSSTDHLEPISLNNVNATSKQTTSYKYKEPAQRVTTNTVKKETASNQATID
TKQFTPFSATAQPRTVYSVSSQKTSSLPKYTPKVNSSINNYIRKKNMKAPRIEEDYTSYF
PKYGYRNGVGRPEGIVVHDTANDNSTIDGEIAFMKRNYTNAFVHAFVDGNRIIETAPTDY
LSWGAGPYGNQRFINVEIVHTHDYDSFARSMNNYADYAATQLQYYNLKPDSAENDGRGTV
WTHAAISNFLGGTDHADPHQYLRSHNYSYAELYDLIYEKYLIKTKQVAPWGTTSTKPSQP
SKPSGGTNNKLTVSANRGVAQIKPTNNGLYTTVYDSKGHKTDQVQKTLSVTKTATLGNNK
FYLVEDYNSGKKYGWVKQGDVVYNTAKAPVKVNQTYNVKAGSTLYTVPWGTPKQVASKVS
GTGNQTFKATKQQQIDKATYLYGTVNGKSGWISKYYLTTASKPSNPTKPSTNNQLTVTNN
SGVAQINAKNSGLYTTVYDTKGKTTNQIQRTLSVTKAATLGDKKFYLVGDYNTGTNYGWV
KQDEVIYNTAKSPVKINQTYNVKPGVKLHTVPWGTYNQVAGTVSGKGDR

LOCUS 2:
ORF1:
RIGGKYMDNIKIIVASDSIGETAELVARAGVSQFNPKQCKHEFLRYPYIESFENVDEVIQ
VAKDTNAIIVYTLIKPEIKKYMISKVNEHALKSVDIMGPLMELLSNSIEETPYYEPGMVH
RLDDAYFKKIDAIEFAVKYDDGKDR
ORF2:
GEAFMVKNMDTIVQLAKHRGFVFPGSDIYGGLSNTWDYGPLGVELKNNIKKAWWQKFITQ
SPYNVGIDAAILMNPKTWEASGHLGNFNDR
ORF3:
RPIELSQRQEQIIEIVKSEGPITGEHIAEKINLTRATLRPDLAILTMSGFIEARPRVGYF
YSGKSKNKIINEKLRKYVVKDYMSHPVVIKENMTVYDAICTIFLEDVSTLFITNENNDFV
GVCSRKDLLRASMIGEDIHTMPISVNMTRMPHVSYLKEQELVIYAANQMIDKEIDSLPIV
RPKENDKFEVIGRISKTTITKLFVSLFKE

LOCUS 3:
ORF1:

SVMKNFILSVQHLLAMYAGAILVPIIVGTSLKFSAEEIAYLVTVDIFMCGVATFLQANKV
TGTGLPIVLGCTFTAVAPMILIGQTKGLDVLYGSLLISGILVVLIAPFFSYLVKFFPPVV
TGSVVTIIGINLMPVAMNYLAGGEGAKNYGDTKNLILGGVTLLIILILQRFTKGFLKSIA
ILIGLAIGTALAGIFGMVDIKQVGDAHWFGFPVPFRFSGFGFDVSSILVFFIVAVVSLIE
STGVYHALSEITGRKLERKDFRKGYTAEGLAIILGSIFNAFPYTAYSQNVGLVSLSGAKK
NNVIYGMVILLLICGCIPKLGALANIIPLPVLGGAMIAMFGMVMAYGVSILGNINFQNQN
NLLIIAISVGLGAGISAVPQAFKGLGEQFAWLTQNGIVLGAISAIILNFFFNGIKYKQTE
ENVK
ORF2:
VESLGRKVKEDGVVIDEKILKVDGFLNHQIDAKLMNDVGKTFYESFKDAGITKILTIEAS
GIAPAIMASFHFDVPCLFAKKAKPSTLKDGFYSTDIHSFTKNKTSTVIVSEEFLGADDKV
LIIDDFLANGDASLGLNDIVKQANATTVGVGIVVEKSFQNGRQRLEDAGLYVSSLCKVAS
LKGNKVTLLGEA
ORF3:
NWRLFLMWENKFAKESLTFDDVLLIPAASDVLPSDVDLSVKLSDKI
LOCUS 4:
ORF1:
YWTYHFKEKGKMVIMDDLKQNQSSNEKPKGNKIINILIFIGMILLIQIPIGVSLIALPFS
VKFSKLTSIALSMLITGTALLIIWLVRNYYLSHTYERQYQSMRGKDIFINIGFLVLSMVF
SILSSVLMVIFTGNDTTANEKEINESLDLLLQKDHLPHISIVATVVLMICIIGPYLEELL
FRGIFKETLFMKYRFWLPFIISSIIFSSQHLSTNIFSYAIYFLMGCVLYLAYNRRRNIKD
SMMVHMLNNSVSTLPVFVGYLWLYFR
ORF2:
DLHIIKGDTPEVKSHTTLGHEGIGIIEEIGDNVNNFKVGDKVIISCISSCGKCYYCKKGI
YAHCENGGGWILGHLVNGTQAEYVKVPFADNSLYHAPSNLKEDALVMLSDILPTGYEIGV
LKGKVKPGCTVAIVGAGPVGLAALLTAQFYSPSKIIMIDLDDNRLETAKELGATHLINSK
ETETAIKKVKSLNPRGVDVAIEAVGIPQTFDLCQNLIGVDGTIANVGVHGLPVQLDIDKL
WIKNINVTTGLVSGNTTEELLEALKSKIIQPEQLVTHYSKLSEIESAYDLFRNATDHKAI
KLIIENDITI
LOCUS 5:
ORF1:
QIVQRKGCHLMKIRVIVPCYNEGEVVLKTYDKLTEIMKKDSLIKNYEYDLLFINDGSTDT
TIHHIKNIVAYDNHVKYLSFSRNFGKEAAMIAGYQHSTMHDAVIMIDGDLQHPPEYIPQM
IEGYIEGYDQVVAKRNRQGENFVRKTLSRCYYKLINAFVEDIQFEDGVGDFRLLSRRAVQ
ALTTLDEYNRFSKGLFEWIGYETKVFQYENVTREDGESKWTFRKLLNYGIDGLISFNNKP
LRMMIYLGMFTFSISILYIIYLLINILINGINIPGYFTTIAAILLLGGIQLMSIGVVGEY
IGRIYYEVKHRPKYIVENSNIQTENLDMRYNALNLNKNRNNKRSNDLYKLSSFYKVKTYS
DTYASNYSQDEGFKERVH
ORF2:
DQLLVNILQPYEQHIKQENRTLEVNFCTDIDAFYQYRPPIERILTNLLDNALKFSNSGSR
IDIIISECKENDVISISIKDEGIGIVPELQSRIFERTFRVEDSRNTKTGGSGLGLYIANE
LAQQIDASITVQSDLDIGTTMTLTLKKFQFKK
LOCUS 6:
ORF1:
SIAGAAIASQGSFAVLHYQGFTKIIIVLIISPIIAFCVGYMMYTIVKIVFKNSNLTRTNR
NFRFFQIFTAALQSFSHGTNDAQKSMGIITLALIVGNLQDGSNVEPQVWVKVACATAMGL
GTAVGGWKIIKTVGGNIMKIRPANGAAADISSALTIFVASSLHFPLSTTHVVSSSILGVG
ASNRAKGVKWSTAQRMVVTWVITLPISAVLAAIIYFIIHLFLK
ORF2:
GGVTLKKLAFAITAASGAAAVLSHHDAEASTQHKVQSGESLWTIAQQYNTSVESIKQNNN

LSNNMVFPGQVINVGGSASQNTSSNTSSSSASSHTVVAGESLNIIANKYGVSVDALMQAN
HLNGYLIMPNQILTIPNGGSGSGSGGTATQTSGNYTSPSFNHQNLYTEGQCTWYVFDKRS
QAGKPISTYWSDAKYWASNAANDGYQVDNTPSVGAIMQSTPGPYGHVAYVERINGDGSIL
ISEMNYANGPYNMNYRTIPASEVSSYAFIH
LOCUS 7:
ORF1:
DHIIRAYHKFLQSGYQTELHLFGRDEDNQIPLMNTLISELKLSDKVKIFKYTNQPLQEFK
NSKASLLTSQYEGFGLTLMESIEMGCPVLSYNVRYGPSEIIQNGINGYLIEKNDIDSLSK
HMINIIEHPLQKVKNKDTLKYNAAVNNYKQLMQSLDLLK
ORF2:
SRGGFQVQKKYITAIIGTTALSALASTHAQAATTHTVKSGESVWSISHKYGISIAKLKSL
NGLTSNLIFPNQVLKVSGSSSRATSTNSGTVYTVKAGDSLSSIAAKYGTTYQKIMQLNGL
NNYLIFPGQKLKVSGKATSSSRAKASGSSGRTATYTVKYGDSLSAIASKYGTTYQKIMQL
NGLTNFFIYPGQKLKVPGGSSSSSSSNNTRSNGGYYSPTFNHQNLYTWGQCTWHVFNRRA
EIGKGISTYWWNANNWDNASAADGYTIDYRPTVGSIAQTDAGYYGHVAFVERVNSDGSIL
VSEMNWSAAPGNMTYRTIPAYQVRNYKFIH
LOCUS 8:
ORF1:
DQFREAMTKFPVWMGATTLFFGAINGAKEMLDVITEIDGKMITLAKVTGDDNALQQTFID
ANNAASQFGQTLGSVLDVYAEFARQGVKGNELSQFSNAALIAANVGEIDAKQASEYLTSM
SAQWETTGNQAMRQVDSLNEVSNKYATTVEKLAQGQAKAGSTAKSMGLTFDETNGIIGAL
TAKTKQSGDEIGNFMKATLPKLYSGKGKSTIEGLGISMKDENGQLKSAISLLEEVSQKTK
NLEKDQKAAVINGLGGTYHYQRMQVLLDDLSKTDGLYKQIKESSESSAGSALQENAKYME
SIEAKVNQAKTAFEQFALAVGETFAKSGMLDGIRMVTQLLTGLTHGITELGTTAPIFGMV
GGAASLMSKNVRSGFEGARSSVANYITEVNKLAKVNNAAGQVVGLQKVQTGTASQLQFNK
NGEYDKAASQAKAAEQATYQFSKAQKDVSASAMIASGAINKTTVATTASTVATRAATLAV
NGLKLAFRGLLAATGVGLAITGVSFVLEKVVGSFNAASQAAEQYKQKQEQTKQAIASMSN
GEINSLISSYDKLQQKMNSGSAFNTAEAEKYKEVTSQLANIFPDLVTGENRYGKEMAGNK
EVMKQKIELIKQEMELERQKNAIKQKEEQDAYIKEQDSLAKKNRGQKWYQLGQTPELKLQ
EQARPTTVSDNSNINKINATIQKVKSQAQAEKALEQVDKQLAQSQTKNRQNEVQHLQKVR
QALQDYITKTGQANQATRAAVLTAQQQFTNQIATMKKLGTTGQQVMTTISNSVAKTAKSG
KAAQATFKSFETSLVKSSSFKSKMASYEASVKKFKNAANQSAKIAALKDVERDYSKVAKG
IMQAAKAANMSKSQMKDLKKSLQQNIQAETGFRASVSKAGKVTIDQSKKIKQNR
LOCUS 9:
ORF1:
VLWGVFDMDLLIGTLFLILVLVIFTLFTYKAPSGMRAMGALANAAIASFLVEAFNKYVGG
QVFGIKFLEELGDAAGGLGGVAAAGLTALAIGVSPVYALVIGAACGGMDLLPGFFAGYIV
GYMMKYTEKYVPDGIDLIGSIILLAPIARLIATGLTPVVNNTLIKIGDIIQSSTDANPLI
MGIVLGGIITVVGTAPLSSMALTALLGLTGAPMAIGAMAAFSSAFMNSALFHRLKLGDRK
STISVGIEPLSQADIVSANPIPIYVTNFFGGAIAGIIIAWSGMINNATGTATPIAGFLVM
FGFNSLTKVIIYGVVMAIIGTIAGIVGSIVFKKYPIITKKQMLERDTTT
LOCUS 10:
ORF1:
MEIKQIKYFVEVVRQGGMTQASEHLYIAQSTISKAIKNIENEYDITLFDRSQKQIKLTDI
GQTFYDNSLEFLALFEKLSLEMNDIVNVQKGHIKIGLSPMMNVQMFTNALNQFHRLYPNV
TYEVIEGGGKIVENLTSNDDVDIGITTLPVDL
ORF2:
LSESANSFYLHVDDFLIRIVKECLLTHVNSKLMLWRFVMGSFFNRMTRKENPTIYQNKDG
HLKRTLRVRDFLALGVGTIVSTSIFTLPGVVAAEHAGPAVALSFLLAAIVAGLVAFTYAE
MASTMPFAGSAYSWINVLFGELFGWVAGWALLAEYFIAVAFVASGFSANLRGLIAPLGIS

LPKSLSNPFGSNGGVIDIIAAVVIILTALLLSRGMNEAARMENVLVILKVLAIILFVIVG
LTAINFSNYIPFIPEHKVTETGDFGGWQGIYAGVSMIFLAYIGFDSIAANSAEAINPQKT
MPRGILGSLIVAIVLFVAVALVLVGMFHYSQYADNAEPVGWALRESGHGIIAAIVQAISV
IGMFTALIGMMLAGSRLLYSFGRDGLLPSWLSQLNHKHLPNRALVILTIIGVVIGSR
LOCUS 11:
ORF1:
DPETLFIVMSQILFHPLVGGFLLAAILAAIMSTISSQLLVTSSSLTEDFYKLIRGSDKAS
SHQKEFVLIGRLSVLLVAIVAITIAWHPNDTILNLVGNAWAGFGAAFSPLVLYSLYWKDL
TRAGAISGMVAGAVVVIVWISWIKPLATINAFFGMYEIIPGFIVSVLITYIVSKLTKKPD
DYVIENLNKVKHVVKE
ORF2:
DQLFKVTESELIEIQDIGDKLAQSVVTYLENSDIRSLIEKLSNKNVNMSYKGIKTTEIEG
HPDFSGKTIVLTGKLEQMTRNEASEWLKMQGAKVTNSVTKSTDIVIAGADAGSKLAKAEK
YGTEIWTEAAFIEKQNGI
ORF3:
MKRTIFLLMSILLLLTACGDGHKQTSSDKEQSEHKDNHNKNQVKQIATDKKVQGDNYRTI
LPFKESQARGLLQDNMANGYNGEDFESGLLELSKEIFPTNKYLYQDGQYLDKKTINAYLD
PKYTKKEIDKMSEKEKKSKNANENLGLNPSHNGETDEEKIAENSPAYLSNILEQDFYGNS
DSKGKNIKGMTIGLAMNSVYYYKKEKDGETFSKDLSDKEIEKQGKQMASEMLSRLRENSD
LKDIPIHFAIYKQSSQDSITPGEFIVGTTVEEGKTKINSWDNINEKAALIPSSTAADYDE
TLNNNFKQFNDNLQSYFSNFTQAVGKVKFVNKKAKQLTVDLPIDYYGQAETIGITQYVTE
QAEKYFDKLDEYEIRIKDGNTPRALISKTKDDKEPQVHIYHN
LOCUS 12:
ORF1:
LDTSKGQSSMEEVLKLKIPASTANLGVGFDSIGMALDKYLHMSIRKIERANWEFLYYSSE
LEGLPKDENNYIYQTALNVARKYNVTLPSLQIEMRSDIPLARGLGSSASALVGALFIANY
FGNIQLSKYELLQLATEIEGHPDNVAPTIYGGLIAGFYNPITKITDVARIEVPHVDIILT
IPPYELRTEDSRRVLPDTFSHKGAVQNSAISNTMICALIQHKYKLAGKMMEQDGFHEPYR
QHLIPEFNQVRKLSRQHDAYATVISGAGPTILTLCPKEKSGKLVRTLREKINNCASELVT
INEIGVKDEVVYLKS
ORF2:
LLKGVLYYMTQYKMVVLDMDDTLMNSDNKLSIETKSYLLDIQKRGYYVVLASGRPTEGML
PTARELELNKYNSFIISYNGGKTINMANENVEVDQPVSKEDFDNIVDYCRDKNFLVLTYD
NGYIIHDSSHEYMNIESQLTGLPMNRVADLKEYINHSVPKVMGVDYVGHITEARIELDGY
FNNDIDVTTSKPFFLEFMAKNVSKGNAIKALCKRLQISLEEVIVFGDSLNDKSMFEVAGY
SVAMGNASDELKKIADEVTLDNNSNGIPYALKELLV

CLAIMS

1. An antigenic polypeptide, or part thereof, encoded by an isolated DNA molecule selected from the group consisting of:

(i) DNA molecules represented by the DNA sequences in Table 7 or 9;

(ii) DNA molecules which hybridize to the sequences identified in (i) which encode a polypeptide expressed by a pathogenic organism; and

(iii) DNA molecules which are degenerate as a result of the genetic code to the DNA sequences defined in (i) and (ii),

for use as a vaccine.

2. An antigenic polypeptide according to Claim 1 wherein said DNA molecule is genomic DNA.

3. An antigenic polypeptide according to Claim 1 or 2 wherein said DNA molecule hybridizes to the the sequences in Tables 7 or 9 under stringent hybridization conditions.

4. An antigenic polypeptide according to any of Claims 1-3 wherein said polypeptide (s) are represented by the amino acid sequences in Tables 8 or 10.

5. An antigenic polypeptide according to any of Claims 1-4 wherein said polypeptide is derived from a bacterial genus/species selected from the group consisting of: *Staphylococcus spp.; Staphylococcus aureus; Staphylococcus epidermidis; Enterococcus faecalis; Mycobacterium tuberculsis; Streptococcus group B; Streptoccocus pneumoniae; Helicobacter pylori; Neisseria gonorrhea; Streptococcus group A; Borrelia burgdorferi; Coccidiodes immitis; Histoplasma sapsulatum; Neisseria meningitidis type B; Shigella flexneri; Escherichia coli; Haemophilus influenzae.*

6. An antigenic polypeptide according to Claim 5 wherein said polypeptide is derived from the genus *Staphylococcus spp.*

7. An antigenic polypeptide according to Claim 6 wherein said polypeptide is derived from the species *Staphylococcus aureus.*

8. An antigenic polypeptide according to Claim 6 wherein said polypeptide is derived from the species *Staphylococcus epidermidis.*

9. An antigenic polypeptide according to any of Claims 1-8 wherein said polypeptide is an opsonin.

10. A vaccine composition comprising at least one antigenic polypeptide according to any of Claims 1-9.

11. A vaccine composition according to Claim 10 wherein said composition further comprises a carrier and/or an adjuvant.

12. A method to immunize an animal against a disease or condition caused by a pathogenic microbe comprising administering to said animal at least one antigenic polypeptide according to any of Claims 1-9 or a vaccine composition according to Claim 10 or 11.

13. A method according to Claim 12 wherein said animal is human.

14. A method according to Claim 12 or 13 wherein said disease or condition is selected from the group consisting of: bacterimia; septic shock; organ infection; skin infection; bacterial nasal colonisation; bacterial eye infections; septicaemia; tuberculosis; bacteria-associated food poisoning; blood infections; peritonitis; endocarditis; sepsis; meningitis; pneumonia; stomach ulcers; gonorrhoea; strep throat; streptococcal-associated toxic shock; necrotizing fasciitis; impetigo;

histoplasmosis; Lyme disease; gastro-enteritis; dysentery; shigellosis; *Staphylococcus aureus*-associated septicaemia, food-poisoning or skin disorders; *Staphylococcus epidermidis*-associated septicaemia, peritonitis or endocarditis.

15. A method according to Claim 14 wherein said disease or condition is the result of a *Staphylococcus spp* infection.

16. A method according to Claim 15 wherein said disease or condition is *Staphylococcus aureus*-associated septicaemia, food-poisoning or skin disorders.

17. A method according to Claim 15 wherein said disease or condition is *Staphylococcus epidermidis*-associated septicaemia, peritonitis or endocarditis.

18. An antibody, or binding part thereof, obtainable by the method according to any of Claims 12-17.

19. An antibody according to Claim 18 wherein said antibody is a monoclonal antibody.

20. An antibody according to Claim 18 or 19 wherein said antibody is a chimeric antibody.

21. An antibody according to Claim 18 or 19 wherein said antibody is a humanized antibody.

22. An antibody according to any of Claims 18-21 wherein said antibody is an opsonic antibody.

23. An antibody according to any of Claims 18-22 wherein said antibody is a therapeutic antibody or a diagnostic antibody.

24. A method for preparing a hybridoma cell-line producing monoclonal antibodies according to Claim 19 comprising the steps of:

i) immunising an immunocompetent mammal with an immunogen comprising at least one polypeptide having the amino acid sequence as represented in Tables 8 or 10, or polypeptide fragments thereof;

ii) fusing lymphocytes of the immunised immunocompetent mammal with myeloma cells to form hybridoma cells;

iii) screening monoclonal antibodies produced by the hybridoma cells of step (ii) for binding activity to the amino acid sequences of (i);

iv) culturing the hybridoma cells to proliferate and/or to secrete said monoclonal antibody; and optionally

v) recovering the monoclonal antibody from the culture supernatant.

25. A method according to Claim 24 wherein said hybridoma cell-line produces opsonic antibodies.

26. A hybridoma cell-line produced by the method of Claim 24 or 25.

27. A method to identify opsonic antigens expressed by a pathogenic microbe comprising:

i) providing a host cell transformed with a DNA library encoding genes, or partial gene sequences, of a pathogenic microbe;

ii) providing conditions conducive to the expression of said transformed genes or partial sequences;

iii) contacting the antigens expressed by said gene sequences with autologous antisera derived from an animal infected with, or has been infected with, said pathogenic microbe;

iv) purifying the DNA encoding antigenic polypeptides binding to said autologous antisera; and

v) testing the opsonic activity of a polypeptide encoded by said DNA molecule.